SURGICAL EPITOME

BY

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Dedicated

TO

MY DEAR FATHER

MR. VITHALRAO S. NADKARNI

Without whose selfless sacrifice, I could never have been whatever I am.

"A real hero is seen more often in everyday life than on a battle-field; in everyday quiet sacrificial sufferances than in temporary homicidal frenzy; on the losing than on the winning side; in darkness and obscurity than in sunshine and limelight. Look around with open eyes, and if you are fortunate enough, you will see one quite near you."

FOREWORD

It must be a matter of pardonable pride for a teacher to be requested to write a foreword to a book by one of his pupils In the present instance it is also a pleasure to do so as the teacher realises that his student has been more industrious than himself

Surgery cannot be learnt from text-books It can only be learnt in the Out patients' Department and the wards of a hospital, under the guidance of a good teacher A good clinical teacher alone can impress upon the student the value of accurate observations and the importance of a correct approach to a Surgical problem

However, the time alloted to the teaching of Surgery in the University curriculum is hardly sufficient to enable the student to attain real proficiency in the subject The present curriculum in Medicine as designed by the different Indian Universities is so overloaded, that it is safe to conclude that it is intended for super students The average student is nightly haunted by the spectre of the approaching examination He has no other alternative but to obtain the requisite knowledge from books The ground that he has to cover in his readings is truly extensive Unless the student has acquired the art of making his own notes, he will find it difficult to "brush up" the different subjects just before his examination

It is at this juncture that Dr Nadkarni's book will be found to be truly serviceable As explained by the author in his very lucid preface, this book is an Epitome of Surgery It is not intended to replace any of the good text-books in Surgery "Surgical Epitome" will provide the means for a very rapid revision of this vast subject

This book will also prove useful to a lecturer in Surgery in bringing before him, in a condensed form, the various points he would like to dilate upon

I wish this publication all success

9-4-44

R N Cooper

PREFACE

Success depends, not on the possession of knowledge—however vast it may be—but on its ready presentation at the required moment; the ready presentation of the knowledge requires excellent memory, which, in its turn, is the outcome of repeated revisions Repeated revisions of a subject, —especially of a vast subject like surgery—are possible only with its concised epitome General reading of a vast subject is comparable to wandering in a dense jungle, exploring its depth, without leaving any marks for the return journey and thus losing one's way, while revisions of an epitome of the subject are just like a provision of landmarks for a path for safe return journey

The author knows many a brilliant student whose main cause of failure was too much and too vast a reading, which naturally was beyond the capacity of digestion Brain is a limited reservoir and after a certain limit, every fact impressed upon it, is at the cost of some other—perhaps more important—fact, which is effaced So the brain should not be overcrowded with irrelevant and unnecessary facts lest important material may be lost in unnecessary details The present epitome can be compared to a review, from an adjoining hillock, of a big city, strewn with familiar landmarks, which helps in giving a general idea of its whole geography.

The author attributes his humble success in academical and professional spheres to revisions—repeated revisions—of his subject While he was a teacher of surgery in medical institutions at Bombay and Poona, he had made up his mind to guide his students along this principle, and the present book is the outcome of all the personal notes he had made for his examinations and teaching

Due to vastness of the subject, the author has arranged the subject matter in two volumes The whole subject has been divided into four parts (1) Tissue Surgery—surgery of anatomical structures, (2) Regional Surgery—surgery of the

Loan Scheme' some years back, which helped me to get the foreign qualifications, and gave me an opportunity of studying surgery in England and Vienna I am sure that they will be proud to know of this outcome of their contributions and will feel that their trust, at the time, was not misplaced

Last, but of course not the least, I thank the authors of all the English, American and Continental Surgical books Monographs and Journals, to which I have made free references

The very fact that the present work was in embryo for the last five years and in print for the last two years, will give an idea of the amount of work and toil behind it But that is not all The book and its author have been passing through an acute crisis in life, and it is a matter of great satisfaction and pride for the author and his helpers to see that the work is seeing the light of the day, inspite of heavy odds against them. The author fully apprehends the result of this hazardous venture taken up by him in these hard days, but sincerely thinks himself to be fully repaid if the work proves to be a benefit to a student and a follower of his dear subject

POONA, D V N
25th March 1944

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Etio Adolescents

Path (A) **Abnormal gum:**
- (*a*) Over growth of œdematous tags
- (*b*) Non separated gums

(B) **Abnormal tooth:**
- (*a*) Encroaching neighbour
- (*b*) Abnormal posture

Clinic **Painful trismus in adolescents or adults**

Compl **Alveolar sepsis** with its sequelæ

Treat. (1) Excision of œdematous tags
(2) Incision or **excision of non separated gum**
(3) Extraction of encroaching neighbour
(4) Extraction of misplaced molar

Post. compl

(A) **Traumatic:**
- (*a*) Hæmorrhage
- (*b*) Fracture tooth with retention of root
- (*c*) Trauma to
  - (α) Mandibular or lingual nerve
  - (β) Jaw fracture or dislocation

(B) **Infective:** Alveolar sepsis

(II) INJURIES OF THE TEETH:

(1) **Concussion:**

Def Tooth driven into its socket

Etio (*a*) Mouth gag
(*b*) Hard bite

Clinic Tender sensitive tooth

Compl (1) Traumatic cyst
(2) Pulpitis
(3) Degeneration

(2) **Fracture:**

Def Broken tooth

Etio Predisposer Caries
Exciting. (*a*) Blows
(*b*) Extraction

Sites (*a*) Crown
(*b*) Root

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(b) Extractio

Sites (a) Crown
(b) Root

(3) **Dislocation**:
Varieties: (a) Partial: loose tooth
(b) Complete
(4) **Attrition and abrasion**

(III) INFECTIONS OF THE TEETH:

(1) DENTAL CARIES

Etio: (a) **Oral sepsis**
(b) Mouth breathing
(c) Deficient enamel
(α) Lack of vitamine D } : **Rickets**
(β) Lack of calcium }

Clinic: (1) Odontalgia
(2) Inspection

Compl: (a) Odontalgia
(b) Pulpitis
(c) **Dento alveolar abscess:**
(α) Acute
(β) Chronic
(d) **Osteo myelitis jaw**
(e) **Regional lymphadenitis**

Treat: (1) **Conservative:**
(a) Application of anodynes
(b) Mouth gargles
(c) Stuffing
(2) **Radical: Extraction** (See under Operations)
Ind: Sepsis beyond the tooth

(2) ALVEOLAR SEPSIS

Def: Septic inflammation of the alveolus
Etio: **Carious tooth**: Especially stuffed
Path: Septic inflammation
of (a) Peridental space
↓ (b) Bone: socket → alveolus → jaw
↓ (c) Periosteum
↓ (d) Gums or subcutaneous tissues

Clinic: (1) **Local**: Acutely painful inflammatory swelling of the alveolus → gums or cheek or sub-maxillary region
(2) **Regional**: Acute lymphadenitis
(3) **General**: Toxæmia

Compl: (1) **Gum boil**
(2) **Alveolar abscess**
(3) **Acute osteomyelitis jaw**
(4) **Acute regional lymphadenitis**
(5) Cellulitis of the neck (Mandible)
↓ (a) Ludwig's angina
or (b) Œdema glottis
or (c) Mediastinitis

(6) Cavernous sinus thrombosis } : (Maxilla)
(7) Antral empyema }
(8) Pneumonia
(9) **Septicæmia**, pyæmia, toxæmia

Sequelæ: (1) **Chronic osteomyelitis jaw**
(2) Chronic lymphadenitis
(3) Sinuses on the face or neck

Treat: (1) Hot antiseptic mouth gargles
(2) Gum boil:
Treat: Incision and drainage
(3) **Alveolar abscess:**
(A) **Within 24 hours + no localisation**
: Conservative treatment:
(*a*) Hot antiseptic mouth-washes
(*b*) Dover's powder
(B) **Local swelling:**
: Intrabuccal operative drainage:
Anæsth: Evipan
Tech. (1) Extraction of the tooth
or (2) Incision of periost. on either side
or (3) External drainage (avoid)
Ind External pointing
Tech Incision close under the lower border of the mandible

(3) ROOT ABSCESS:

(A) **Acute:**
Etio: (1) Impacted tooth
(2) **Caries tooth**
Path: Pus under tension around the tooth root
Clinic: Severe toothache with toxæmia
Compl: Acute osteomyelitis jaw
Treat: Immediate extraction

(B) **Chronic:**
Etio: Chronic non pyogenic streptococcal tooth infection
Path: **Septic absorptive changes around the roots:**
(*a*) With pus
(*b*) Without pus
Clinic: (1) **Metastatic septic troubles:**
. Arthritis, myositis, fascitis
(2) **Radiography:**
(*a*) Diffuse bony absorption } around the root
(*b*) Abscess cavity }
Treat: (1) Apicectomy
(2) Extraction

(4) MEDIAN MENTAL SINUS:

Def: Paradental abscess in connection with the roots of the lower incisors, which has tracked down to the mental region

Clinic (1) Sinus over the symphysis menti

(2) Radiography

Treat Extraction of the offending tooth

(IV) NEW GROWTHS OF THE TEETH: Odontoma

Def. A tumour arising from a tooth germ or a developing tooth and composed of dental tissues in varying proportions and in different degrees of development

(A) Epithelial odontome:

(a) **Dental cyst:**
- (1) Single cyst
- (2) *Normally erupted carious tooth*
- (3) Upper jaw

(b) **Dentigerous cyst: Follicular odontome**
- (1) Single cyst
- (2) Un erupted tooth
- (3) Lower jaw

(c) **Multilocular cystic disease: Adamantinoma**
- (1) Multilocular, lobulated, central expansion With egg shell crackling
- (2) Many loose or fallen teeth
- (3) Lower jaw

(d) Eruption cyst

Etio Delayed eruption

Path Stimulation of epithelium

Clinic Bluish swelling over a tooth in the process of eruption

(B) Connective tissue odontomes

(a) Fibrous Fibrous swelling with non-erupted tooth

(b) Cementome Bony swelling with non-erupted tooth

(C) Composite odontomes

Path (a) Disordered growth of tooth germ

↓ (b) Irregular conglomeration of

(α) Enamel

(β) Dentine

(γ) Cement

Clinic Swelling containing conglomerate mass of denticles

(D) Compound follicular odontome

Path Multiple denticules surrounding a non erupted tooth, encapsuled in fibrous or osseous capsule

Clinic (a) Solid swelling of the jaw

(b) Multiple un-erupted teeth

(E) Radicular odontome

Path Tumour in connection with a fang of a normally erupted tooth

Clinic (a) Normal tooth

(b) Solid swelling at the root

(F) Malignant odontome:
: Malignant degeneration of any of the preceding odontomes

Radiological pictures:

(1) Cavity at the root of a normally erupted tooth.
(a) Root abscess
(b) Dental cyst

(2) Cavity with a tooth inside:
(a) Un-erupted tooth
(b) Dentigerous cyst

(3) Multilocular cavity with central expansion
: Multilocular cystic disease
: Myeloma

(4) Bony shadow with non-erupted tooth inside.
Cementome

(5) Mass of multiple denticules only.
. Composite odontome

(6) Non-erupted tooth + multiple denticules.
. Compound odontome

(7) Solid shadow from a fang of a normal tooth.
. Radicular odontome

Treatment of odontomes:

(1) Scraping + Tr. iodine swab
(2) Local excision
(3) Excision of the jaw

(V) OPERATIONS ON THE TEETH:

Tooth Extraction:

Pre oper: (1) X Ray
(2) Oral hygiene

Tech: (1) Adaptation to the tooth
(2) Separation from the alveolus
(3) Removal from the socket

Instr. (A) Upper teeth: Straight forceps
(B) Lower teeth: Hawk bill right angled forceps

Points: (1) Do not include the gums in the grasp
(2) Do not apply the forceps between the roots
(3) Take a firm grasp of the base
(4) Movements to loosen the teeth.
(a) Incisors. rotatory
(b) Others. lateral leverage
(5) Examine every removed tooth for fracture

Compl. (1) **Hæmorrhage:**
Etio: (a) Hæmophilia
(b) Injury to alveolar vessels
Path: (1) Primary
(2) Reactionary

Treat: (A) **Local:**
- (1) Removal of loose bone fragments
- (2) **Gauze pack with styptics:**
  - (*a*) Adrenaline
  - (*b*) Snake venom: Stypven
  - (*c*) Ferropyrin
- (3) **Mattress suture of gums**
- (4) 'Stopper method':
  - (*a*) Gauze pack
  - (*b*) Dental stopper
  - (*c*) Fourtailed bandage

(B) **General:**
- (1) 20 c.cs. of alien blood into rectus sheath
- (2) Intravenous calcium
- (3) Horse serum
  Coagulen-'Ciba'
- (4) Blood transfusion

(C) **Operative:**
: Ligature of posterior palatine artery at the posterior palatine foramen

Ind: Bad hæmorrhage from upper jaw socket

(2) **Fracture tooth:** *With retention of root*
(3) Extraction of wrong tooth: replace immediately
(4) **Fracture or dislocation jaw**
(5) Trismus
(6) **Laceration of the gums**
(7) **Swallowed tooth**

(B) THE GUMS

(I) HYPERTROPHY OF THE GUMS:
Etio: Mentally defective children or young adults
Clinic. Hypertrophied polypoid gums burying the teeth
Treat: Alveolectomy

(II) PERIODONTAL INFLAMMATION:

(1) GINGIVITIS:

Def: Inflammation of the muco-periosteal layer which festoons the margins of the teeth

Etio: (*a*) **Gingival trough**
(*b*) **Oral stagnation**
(*c*) General lowered resistance

Varieties: (1) **Primary:**
- (*a*) **Non-specific:** Oral sepsis
- (*b*) Specific. (α) **Syphilis**
  (β) Fuso spirillary

(2) **Secondary:**
(a) Non specific: (α) Pregnancy
(β) **Avitaminosis**
(γ) **Blood diseases**
(b) Specific: (α) **Mercury**
(β) Bismuth

(2) PERIODONTITIS
Def. Inflammation of periodontal membrane
Etio (a) Traumatic
(b) Chemical
(c) Bacterial
Varieties (1) Acute or chronic
(2) Local or general
Clinic Raised tender tooth
Compl (a) Exostosis of the root or cementosis
(b) Rarefaction of the root

(3) PARA ODONTAL INFECTION
Syn **Pyorrhœa alveolaris:**
Etio. (a) Elongation and loosening of the teeth
(b) **Oral stagnation**
Path. (1) **Marginal:** Pyorrhœa alveolaris
(2) Proliferative Generalised cementosis
. 'Gouty teeth'
(3) Rarefying
Clinic Pus exuding from gingivo dental space
Compl **Septic metastases:** (a) **Surgical dyspepsia**
(b) Arthritis
(c) Myositis and fascitis
Treat (A) **Conservative:**
(a) **Oral hygiene**
(b) **Vaccine therapy**
(B) Operative
(a) Gingivectomy
(b) Gingivoplasty

(4) GUM BOIL.
Def Collection of pus between a tooth and the gum
Etio. **Carious tooth**
Clinic (a) Dental sepsis
↓ (b) Soft, local, fluctuating swelling under the gums, round about the carious tooth
Treat: (a) Incision and drainage
↓ (b) Look for and remove carious bone
After treat. Antiseptic mouth washes

(III) **EPULIS:**
Def. Swelling. (a) Arising from the alveolus

Varieties (1) **Granulomatous:**

(2)
(3)
(4) **Myelomatous:** Alveolar myeloma
(5) Carcinomatous Carcinoma gums

(IV) BLEEDING GUMS:

(1) **Pyorrhœa alveolaris**
(2) **Scurvy**
(3) **Purpura**
(4) **Hæmophilia**
(5) **Granulomatous epulis**

(C) THE JAWS

(I) CONGENITAL AFFECTIONS:

CLEFT PALATE

Etio (1) **Hereditary**
(2) White races
(3) Males

Varieties (1) **Rudimentary uvula:** With short soft palate
(2) **Bifid uvula**
(3) **Cleft soft palate**
(4) Cleft soft and hard palate **Intermaxillary**
Between palatine processes
(5) Cleft hard palate **Pre maxillary**
Between maxilla and pre maxilla
(6) **Bipartite:** Between
(a) Maxilla + palatine process
& (b) Pre maxilla + maxilla + palatine process
(7) Bipartite with unilateral hare lip
(8) **Tripartite:** Between
(a) Maxilla } Bilateral
(b) Pre maxilla } Bilateral
(c) Palatine processes
(9) Tripartite with bilateral hare lip

Degrees (A) **Pre alveolar** cleft Hare lip
(a) Incomplete or complete
(b) Unilateral or bilateral
(B) **Alveolar** cleft (Anterior)
(a) Unilateral (α) Pre maxillary
(β) Bipartite
(b) Bilateral (α) Pre maxillary
(β) Tripartite
(C) **Post alveolar** cleft (Posterior)
(a) Complete Uvula to alveolus
(b) Incomplete Soft palate

(D) **Total** cleft :
(*a*) Bipartite or tripartite cleft palate
+ (*b*) Unilateral or bilateral hare lip

Path Failure of union of
(*a*) **Globular** process with maxillary process
and/or (*b*) **Maxillary** process with its opposite fellow

Clinic (1) Nasal **regurgitation**
(2) Indistinct and nasal **phonation** :
Inability to pronounce consonants
p, t, k, ch, s, j, z
(3) **Deformity** :
(*a*) Hare lip If associated
(*b*) Prominent pre maxilla
(*c*) Defect in the palate soft and/or hard

Compl (1) Associated deformity imperforate anus
spina bifida
talipes, etc.
(2) **Dysfunction** : (*a*) Phonation
(*b*) Deglutition
(3) Tendency to respiratory complications

Treat **Palatoplasty** :
Time (1) Hare lip 4 to 8 weeks
(2) Soft palate end of first year
(3) Hard palate end of 2nd to 3rd year
(Before child learns to talk)

Pre oper (1) Oral hygiene
(2) Respiratory prophylaxis
(3) Choice of time
(*a*) Best general health
(*b*) Good weather

Tech (A) Brophy Wiring of maxillae
Age 3 months
Seq Necrosis maxillæ
(B) Lane Muco periosteal flaps
Age 6 weeks to 12 weeks
Seq (*a*) Cicatrisation
(*b*) Immobility and shortening of soft palate

(C) **Langenbeck or Dieffenbach—Warren** :
Age 18 months to 30 months
Tech (1) **Lateral tension relief incisions**
(2) Paring the cleft edges
(3) Separation of muco periosteum
(4) Suture across the cleft
Seq Shortening and forward displacement of soft palate

(c) **Nose:** (α) Deviation of the nose
(β) Flat tip nose
(γ) Flat nostril

(II) TRAUMA:

(1) SUBPERIOSTEAL HÆMATOMA

Etio Boxers
Site Lower jaw chin, angle
Clinic (a) History
(b) Tender local swelling adherent to bone
Diff. diag (1) Fracture
(2) New growth
Compl (1) Ossification
(2) Periostitis

(2) FRACTURE JAW (See under Fractures)

(3) DISLOCATION JAW (See under Dislocations)

(4) DISPLACED MANDIBULAR CARTILAGE
(See under Dislocations)

(III) INFECTIONS OF THE JAW:

(1) PERIOSTITIS

Etio (a) Trauma
(b) Sepsis
Clinic Inflammatory swelling confined to one surface of the bone
Compl (a) Superficial necrosis
(b) Soft tissue infection
Treat Incision and curettage

(2) ACUTE OSTEOMYELITIS JAW

(A) **Upper jaw:**
Etio Infants
Clinic (a) Puffiness of the face under the eyes
↓ (b) Abscess cheek
↓ (c) Sinus cheek

(B) **Lower jaw·**
Etio **Alveolar abscess**
Clinic (1) Diffuse œdematous inflammatory swelling
(2) Painful trismus
(3) Acute general toxæmia or septicæmia
Diff diag (1) Acute cellulitis Ludwig's angina
(2) Acute lymphadenitis
(3) Acute parotitis
Compl (1) Acute extensive necrosis
(2) Cervical cellulitis → œdema glottis
(3) Sinus thrombosis
(4) Septic pneumonia
(5) Septicæmia

(3) CHRONIC OSTEOMYELITIS AND NECROSIS OF THE JAW.

Etio (1) Alveolar abscess **Dental sepsis**
(2) Trauma **Compound fracture**
(3) Acute osteomyelitis
(4) Exanthemata
(5) Syphilis and its treatment
(6) Chemical phosphorus, **mercury**
(7) **Cancrum oris**
(8) Radium necrosis
(9) Actinomycosis

Clinic (A) **Diffuse stage:**
(*a*) Painful trismus
(*b*) Tender œdematous diffuse swelling
(*c*) General toxæmia

(B) **Local stage:**
Local subperiosteal → subcutaneous abscess

(C) **Final stage:**
Sinuses discharging pus

Treat (1) **Oral hygiene:**
(*a*) Mouth washes
(*b*) Laxatives

\+ (2) **Antiseptic & antispecific**

↓ (3) **Sequestrotomy:**
(*a*) From inside the mouth
(*b*) From outside

(IV) TUMOURS OF THE JAW:

(A) INNOCENT TUMOURS

(1) **Osteoma**· Ivory, cancellous
(2) Chondroma
(3) Myxoma
(4) **Myeloma Osteoclastoma**
(5) Lipoma subperiosteal
(6) Fibroma periosteal

Clinic Pedunculated hard intrabuccal tumour

(7) **Odontoma**: (See under Teeth)

(B) MALIGNANT TUMOURS

(1) SARCOMA

(*a*) **Periosteal:**

Path Ossifying, very malignant
Clinic Rapidly growing diffuse tumour
Treat (α) Excision
(β) Deep X Rays

(*b*) **Endosteal**

Clinic Chronic osteomyelitis
Treat (*a*) Excision
(*b*) Deep X Rays

(*c*) **Secondary sarcomatosis**

Clin c *Hard mult ple cystic masses in the jaw*
In general sarcomatosis
Treat Deep X Rays

(2) MELANOMA MALIGNUM

Path Spindle celled with melanin
Clinic Bluish black lump
Treat (*a*) Excision
(*b*) Radiotherapy

(3) CARCINOMA

Path (*a*) **Squamous** Extension from tongue or floor of the mouth
(*b*) **Columnar** From
(α) Periodontal membranes
(β) Air sinuses
(*c*) **Secondary** To (1) Breast
(2) Bronchus
(3) Kidney
(4) Prostate
(5) Thyroid

(4) ENDOTHELIOMA

Malignant tumours of the upper jaw

(1) MAXILLARY PERIOSTEAL SARCOMA

Etio **Females of 45**
Site Anterior surface
Clinic (1) **Rapidly growing swelling**
(2) **Deformity**
Diff diag (*a*) Antral empyema
(*b*) Bone cysts
(*c*) Leontiasis ossea
Treat (A) Operative
(*a*) Preliminary ligature of external carotid
↓ (*b*) Excision of the maxilla
(B) Deep X Ray therapy

(2) Maxillary endosteal sarcoma

(3) Maxillary carcinoma

Clin c (1) **Latent** No symptoms and signs
↓ (2) **Pseudo-sinusitic**
(*a*) Nasal discharge
(*b*) Antral signs

↓ (3) **Tumour stage:** With deformity
(a) Central swelling. encroaching on.
(1) Orbit
(2) Nasal fossa
(3) Palate
(4) Cheek
(5) Pterygoid fossa
(b) Pressure symptoms.
(1) Nasal obstruction
(2) Epiphora
(3) Trigeminal neuralgia
(4) Depressed palate
(4) **Ulcerating stage:** (a) Palate
(b) Cheek

Compl. (1) Hæmorrhage
(2) Hideous deformity
(3) Chest complications
(4) Neuralgia
(5) Cachexia

Treat: (a) Excision of the maxilla
(b) Radiotherapy

(V) OTHER DISEASES OF THE JAW:

(1) LEONTIASIS OSSEA.

Path. Creeping periostitic hyperostosis of both the jaws.
. Due to some infective focus

Clinic. (a) Hideous deformity, especially of upper face
(b) Pressure symptoms

(2) OSTEITIS DEFORMANS: (See under Bones)

Clinic: Porosity and cystic enlargement of the mandible

(3) OSTEITIS FIBROSA (See under Bones)

(4) ACROMEGALY

Etio: Hypertrophic and hyperactive anterior pituitary

Clinic: (1) Prognathous lower jaw
(2) Other signs of acromegaly.
: (See under Pituitary Gland)

(D) THE PALATE

(I) CONGENITAL AFFECTIONS:

Cleft palate. (See above)

(II) TRAUMA:

: **Penetrating injuries**

Etio: Fall on projecting objects with open mouth

(III) PERFORATIONS OF THE PALATE:

(1) **Post-operative perforation:**
: After palatoplasty for congenital cleft
(2) Traumatic
(3) **Syphilis:** Gumma of the palate
(4) **Malignant:** (*a*) **Carcinoma**
(*b*) **Rodent ulcer**
(5) Tuberculous: lupus

(IV) *TUMOURS OF THE PALATE:*

(1) **Mixed tumours**
(2) *Hæmangioma.*
Diff. diag: From peritonsillar abscess
(3) Adenoma and adeno carcinoma
(4) Osteoma: torus palatinus
(5) **Carcinoma:**
(*a*) Ulcerating tumour
(*b*) Raised infiltrating plaque

(E) OPERATIONS ON THE JAW

(1) EXCISION OF THE LOWER JAW:
Ind (1) Epulis
(2) Odontome
(3) Malignancy
(4) Extensive necrosis
Pre-oper: Oral hygiene
Anæsth (*a*) Intratracheal with pharyngeal plugging
(*b*) Regional
(α) Mandibular division of trigeminal
+(β) Midpoint of posterior border of sternomastoid
Tech (1) Incision (*a*) Centre of the lower lip
↓ (*b*) Symphysis menti
↓ (*c*) Along the lower border of mandible
↓ (*d*) Angle of the mandible
↓ (*e*) Lobule of the ear
(2) Ligature of facial vessels
(3) Isolation of jaw from soft tissues
(4) Extraction of the incisors
(5) Division of the jaw to one side of midline
(6) Division of internal attachments
(*a*) Inferior dental vessels
(*b*) Temporal and external pterygoid tendons
(*c*) Capsule of the temporo-mandibular joint
Save. (1) Facial nerve
(2) Internal maxillary vessels
(3) Oral cavity and pharynx
(2) EXCISION OF THE UPPER JAW:
Ind: Malignancy
Pre-oper: (1) Oral hygiene
(2) Preliminary ligature of external carotid

Anæsth (a) Intratracheal with pharyngeal plug
(b) Regional (α) Trigeminal ganglion
or (β) Maxillary nerve

Tech (1) Incision (a) Malar region
↓ (b) Lower eyelid
↓ (c) Nasal attachment
↓ (d) Columella
↓ (e) Philtrum
↓ (f) Centre of the upper lip
(2) Outward reflection of the soft tissue flap
(3) Elevation of periosteum of the orbital floor
(4) Division of bone
(a) Maxillo malar junction
(b) Nasal process of maxilla
(5) Intra buccal manœuvres
(a) Extraction upper incisor
(b) *Incision centre of the hard palate*
(c) Detachment of soft from hard palate
(6) Naso buccal manœuvres
Section of alveolus and hard palate
(7) Detachment of maxilla
(8) Closure

After treatment of excision jaw
(1) Propped up posture
(2) Oral hygiene sprays, syringes, gargles
(3) Respiratory precautions

Complications of excision jaw
(1) Shock
(2) Haemorrhage
(3) Asphyxia
(4) Lung complications Aspiration pneumonia
(5) Local sepsis

Sequelæ (1) **Deformity**
Treat (a) Obturator maxilla
(b) Bone graft mandible
(2) Epiphora maxilla
(3) Facial paralysis
(4) Fistulæ
(5) **Recurrence of malignancy**

(F) THE MOUTH CAVITY

(I) CONGENITAL AFFECTIONS:
(1) CLEFT PALATE (See under Jaws)
(2) TONGUE AFFECTIONS (See under Tongue)

(II) INFLAMMATIONS OF THE MOUTH:
(1) STOMATITIS

Etio varieties (A) **Primary:**
- (a) **Non specific:** Septic catarrhal
- (b) **Specific;** Syphilis

(B) **Secondary:**
- (a) General anæmia, sprue
- (b) Local around
  - (α) Stensen's duct
  - (β) *Wharton's duct*
  - (γ) Septic tooth

Path varieties (A) **Catarrhal:**

Etio
- (1) Oral sepsis
- (2) Alimentary sepsis
- (3) Abdominal and buccal operations

Causes
- (1) Oral **dehydration**
- (2) Oral and alimentary **stagnation**
- (3) Oral **sepsis**

Clinic Raw tongue and buccal muc mem

Compl
- (1) **Parotitis**
- (2) **Cancrum oris**

Treat
- (a) Antiseptic gargles and applications
- (b) Lemon to suck
- (c) Laxatives

(B) **Aphthous:**

Etio Oidium albicans fungus sour milk

Clinic
- (a) *Infants*
- (b) Yellow spotted stomatitis

(C) **Vincent's:** Trench mouth

Etio Vincent's spirillum

Clinic
- (a) Adults
- (b) Grey spotted stomatitis

(D) **Ulcerative**

Etio
- (a) Syphilis
- (b) Mercury

Clinic Stomatitis with multiple ulcers

(E) **Gangrenous:**

Etio
- (a) Cancrum oris
- (b) Acute infections

Treat (1) **Oral hygiene:**
- (A) Flushing Lemon to suck
- (B) Cleansing
  - Sprays, Syringing, Gargles } Condy's, Hydrogen peroxide, Listerine
- (C) Applications antiseptic, emollient

(2) **Intestinal hygiene:**
(A) Laxatives
(B) Intestinal antiseptics

(3) **Specific**

(2) CANCRUM ORIS:

Def: Fulminating streptococcal gangrene in marasmic children, starting on the inner side of the cheek and spreading through and through

Clinic: (1) Local: (a) Grey patch
↓ (b) **Black patch**
↓ (c) Ulceration
↓ (d) Perforation
↓ (e) Sloughing
: **of the cheek** from inside out

(2) General. Acute toxæmia

Compl: (a) Toxæmia or septicæmia
(b) **Exhaustion**
(c) Cavernous thrombosis

Sequelæ: (1) **Deformity**
(2) Necrosis of the bones
(3) Perforation of the palate
(4) Stricture of the Stensen's duct

Treat: (A) Local: (a) **Cautery excision + 10% formalin**
↓ (b) Plastic surgery
(B) General: (a) Antitoxic
(b) Supportive: blood transfusion

(III) CYSTS IN THE MOUTH CAVITY:

(1) RETENTION MUCOUS CYST:

Site: Buccal mucous glands of the lip or cheek
Clinic: Small, transparent, bluish

(2) RANULA:

Def: A cystic swelling in the floor of the mouth

(A) **Simple:**

Origin: (a) Mucous glands of the mouth floor
(b) **Glands of Blandin and Nuhn**
(c) Submaxillary gland and duct
(d) Sublingual
(e) Branchial

Clinic: Rounded, **bluish**, opalescent, **translucent**, fluctuating swelling **under the tongue**, to one or other side of the frænum, containing **slimy colourless material**, and with Wharton's duct coursing over it.

Treat: **Intrabuccal excision** of the free wall:
: (Marsupialisation)

Post. compl: (1) Injury to Wharton
(2) Ankyloglossia
(3) Recurrence

(B) **Deep or plunging:**

Clinic. (*a*) Simple sublingual ranula
+ (*b*) *Submental projection*

Treat: **Cervical excision**

(3) SUBLINGUAL DERMOID.

Origin. Mesobranchial field of His

Clinic. Big, thin walled, opaque, **midline**, sublingual cyst projecting into the mouth and in the neck, and containing **sebaceous material**

Treat **Cervical excision**

(4) INTRA ORAL THYROGLOSSAL CYST:

Path· Remnant of thyroglossal duct

Site· **Below the posterior third of the tongue**

Clinic Deep cystic swelling below the base of the tongue containing **glairy fluid**

(IV) INTRABUCCAL TUMOURS:

(1) HÆMANGIOMA

Sites. (1) Cheek
(2) Floor of the mouth
(3) **Tongue**

Compl: Hæmorrhage

(2) PAPILLOMA

Sites: (1) Cheek
(2) Gums
(3) **Tongue**
(4) Lips

Clinic. Warty projection over the mucous membrane

Diff. diag (*a*) Septic proud granulations: Granulomatous epulis
(*b*) Carcinoma

Compl: Carcinoma

Treat: Excision

(3) *MIXED MOLAR TUMOURS:*

Sites. Palate, cheek

Path: Same as mixed salivary tumours

(4) SUCKING PAD LIPOMA:

Site: Between the masseter and the buccinator

Path: Lipoma

(5) CARCINOMA:

Etio. (*a*) *Syphilis*

(*b*) **Plumer-Vinson syndrome:**
: Dysphagia and achlorhydric anæmia with buccal mucous atrophy in women between 15 and 40
(*c*) **Betel-nut** and tobacco
(*d*) Septic tooth
(*e*) Papilloma

Sites: (1) Lateral margin of the **tongue**: septic tooth
(2) **Floor** of the mouth: extension from tongue
(3) **Labio-alveolar sulcus:** betel nut
(4) **Roof** of the mouth: hard or soft palate
(5) **Cheek:**

Etio: Leukoplakia: 70%
Path: (1) Epithelioma. 90%
(2) Adeno carcinoma

Clinic (1) **Warty**
(2) **Ulcerative**
(3) **Latent:**
: Biopsy of a seemingly innocent tumour

Treat: (A) **Primary:**
(1) Surgical excision: (*a*) Knife
(*b*) Cautery
or (2) Irradiation
(B) **Secondary glandular metastases:**
(1) Surgical excision
or (2) Irradiation
(C) **Preliminary or palliative:**
. Alcohol injection of trigeminal

(V) ORAL DIFFUSE SUBMUCOUS FIBROSIS:

Etio: Young anæmic adults
Clinic: Trismus
Treat. (A) Local open with mouth gag under anæsth.
(B) General. treat the anæmia

(G) THE TONGUE

(I) CONGENITAL MALFORMATIONS:

(1) Total absence
(2) Bifid tongue
(3) Ankyloglossia. (*a*) Superior
(*b*) Inferior
(4) Mobile tongue

(5) TONGUE-TIE:
Def: **Inability to protrude the tongue line of the teeth**
Clinic: (1) Speech abnormality

(2) Non-protrusion of the tongue
Treat: Frænum nicked near the jaw
Post. compl: (a) Hæmorrhage
(b) Injury to Wharton's duct
(c) Chronic ulcer
(d) Cicatrisation: Ankyloglossia
(e) Macroglossia

(6) LINGUAL THYROID:
Path: Remnant thyroid tissue at the lingual base
Clinic: Rounded vascular tumour at the lingual base
Compl: (a) Dysphagia
(b) Dyspnœa
(c) Hæmorrhage
Treat: Leave it alone
Post-compl: (a) Hæmorrhage
(b) Myxœdema

(II) TRAUMA:

(1) WOUNDS:
Etio: Bites, falls
Pre-disp: (a) Anæsthesia
(b) Epilepsy
(c) Paralysis
Compl: (1) **Hæmorrhage**
(2) Retention of foreign body
(3) Abscess

(2) HÆMORRHAGE:
Causes: (a) **Primary**: Traumatic
: Operative
(b) **Secondary**: Sepsis
: Hæmangioma
: Malignancy
Treat: (1) **Apical stitch** traction
↓ (2) **Heath**: Base of the tongue with hyoid hooked forwards by the fore-finger
↓ (3) Undermining sutures
↓ (4) *Ligature of lingual or ext. carotid artery:*
Ind: (a) Preliminary to operations
(b) Uncontrollable secondary hæmorrhage

(3) BURNS AND SCALDS:
Etio: (1) Hot fluids
(2) Corrosive poisons
Compl: (a) Acute glossitis
(b) Œdema glottis
(c) Pneumonia
Sequelæ: (1) *Ankyloglossia*
(2) Chronic ulceration → epithelioma

(III) INFLAMMATIONS:

(A) *ACUTE GLOSSITIS:*

(1) ACUTE SUPERFICIAL GLOSSITIS:

Etio: Burns, injuries

Path: (*a*) **Local:** Traumatic
- (*b*) **Diffuse:**
  - (α) Nervous. herpetic
  - (β) Membranous: diphtheritic
  - (γ) Pellicular: smokers

Treat: (1) Local: (*a*) Soda bi carb 30 gr. to dr. 1
- (*b*) Zinc sulphate 2 gr. to oz. 1
- (2) Internal: Pot. chloras
- (3) Specific: Sera

(2) ACUTE PARENCHYMATOUS GLOSSITIS:

Etio: (1) Septic mouth
- (2) **Mercury**
- (3) Ludwig's angina

Clinic: (1) Œdematous, swollen, furred tongue
- (2) Local and reflex pain
- (3) Profuse salivation
- (4) [illegible] ial)
- (5) [illegible]
- + (*b*) Floor of the mouth
- (6) Cervical lymphadenitis
- (7) Acute toxæmia

Compl: (*a*) Abscess
- (*b*) Gangrene
- (*c*) **Œdema glottis**
- (*d*) **Aspiration pneumonia**

Treat: (1) Expectant: (*a*) Gargles, ice, leeches
- (*b*) Purges
- (2) Operative:
  - Ind: Persistent or severe swelling
  - Tech. **Free incisions:**
    - : Into the dorsum
    - : $\frac{1}{3}$rd inch on either side of midline
    - : $\frac{1}{3}$rd inch deep

(3) BASAL GLOSSITIS.

Etio. Predisposers: (*a*) Anæmia
- (*b*) Constant use of voice
- Exciting · Inhaled irritation

Path: Lingual tonsillitis

Clinic: Congested and swollen lingual base

Compl: Abscess

Treat (a) Mercurial purge
(b) Pot. chlorate gargles
(c) Quinine salicylate

(4) ABSCESS OF THE TONGUE
Etio (a) Trauma
(b) Acute parenchymatous glossitis
(c) Basal glossitis
Clinic Local inflammatory induration with no fluctuation
Treat Incision → evacuation → gargles

(5) GANGRENE OF THE TONGUE
Etio (1) Acute parenchymatous glossitis
(2) Syphilis and mercury
(3) Cancrum oris
(4) Ligature of both lingual arteries

(B) *CHRONIC GLOSSITIS*

(1) LOCAL INDURATIVE GLOSSITIS

Etio (1) **Septic tooth**
(2) **Wharton's duct calculus**
Clinic Chronic local glossitis around a focus
Compl (a) Ankyloglossia
(b) Carcinoma
Treat Treat the primary focus

(2) DYSPEPTIC TONGUE

Etio (a) Dyspepsia with constipation
(b) Idiosyncrasy to certain foods
Clinic Raw, beefy, excoriated tongue
With dyspeptic painful ulcers
Treat (a) Antiseptic gargles
(b) Chromic acid (10 grs to oz 1) paint
(c) Laxatives and intestinal antiseptics

(3) LEUKOPLAKIA **Chronic superficial glossitis**

Def (1) Chronic superficial glossitis with
(a) Patchy heaps of keratinised epith
(b) Atrophy of lingual papillæ
(c) Chronic inflam. of subjacent dermis
(2) An intractable form of chronic hyperplasia with a definite tendency towards cancerous change
Etio Sex Males
Age **After 30**
Pre-disposers **'Six Ss'**: Syphilis, sepsis, sharp tooth
Smoking, spices, spirits

Path: **Chronic inflammatory hyperplasia of the superficial tissues of the tongue:**
(1) Hyperplastic and keratinised epith.
(2) Atrophy of papillæ
(3) Lymphocytic infiltration of the dermis
(4) Vacuolisation of Malpighian layer cells

Clinic: Stage (1): Enlarged papillæ
Stage (2): Butlin's 'white paint' tongue
Stage (3): Red glazed tongue
Stage (4): Cracks', fissures, ulcers and warts
: Leukoplakic patches:
(*a*) Network type
(*b*) White type
(*c*) Warty type

Compl: Carcinoma

Treat: (A) Conservative:
(*a*) Pot. chlor gargles
(*b*) Chromic acid paints. (dangerous)
(*c*) White vaseline smears
(B) Operative: **Butlin's operation:**
: Excision of affected mucous membrane of the tongue
(C) Radium
(D) Contact X-Ray therapy

(4) ERYTHEMA MIGRANS.

Syn: Geographical tongue
Etio: Debilitated children
Clinic: Enlarging patches of smooth red areas with a life history of seven days.
Treat. (1) Astringent mouth-washes
(2) Tonics

(5) GLOSSODYNIA EXFOLIATIVA:

: Neuralgia of lingual nerve associated with thinning of the epithelium

(6) FURROWS OF THE TONGUE:

Varieties: (A) Natural: longitudinal
(B) Acquired transverse
Etio: Chronic inflammation
Compl: Carcinoma
Treat: (*a*) Antiseptic mouth washes
(*b*) Chromic acid paints
(*c*) Ointments

IV) ULCERS OF THE TONGUE:

(1) SIMPLE ULCER:

Etio: Chronic superficial glossitis

Treat (a) Mercurial purge
(b) Pot. chlorate gargles
(c) Quinine salicylate

(4) ABSCESS OF THE TONGUE

Etio (a) Trauma
(b) Acute parenchymatous glossitis
(c) Basal glossitis

Clinic Local inflammatory induration with no fluctuation

Treat Incision → evacuation → gargles

(5) GANGRENE OF THE TONGUE

Etio (1) Acute parenchymatous glossitis
(2) Syphilis and mercury
(3) Cancrum oris
(4) Ligature of both lingual arteries

(B) *CHRONIC GLOSSITIS*

(1) LOCAL INDURATIVE GLOSSITIS.

Etio (1) **Septic tooth**
(2) **Wharton's duct calculus**

Clinic Chronic local glossitis around a focus

Compl (a) Ankyloglossia
(b) Carcinoma

Treat Treat the primary focus

(2) DYSPEPTIC TONGUE

Etio (a) Dyspepsia with constipation
(b) Idiosyncrasy to certain foods

Clinic Raw, beefy, excoriated tongue
With dyspeptic painful ulcers

Treat (a) Antiseptic gargles
(b) Chromic acid (10 grs to oz 1) paint
(c) Laxatives and intestinal antiseptics

(3) LEUKOPLAKIA **Chronic superficial glossitis**

Def (1) Chronic superficial glossitis with .
(a) Patchy heaps of keratinised epith
(b) Atrophy of lingual papillæ
(c) Chronic inflam. of subjacent dermis
(2) An intractable form of chronic hyperplasia with a definite tendency towards cancerous change

Etio Sex Males
Age **After 30**

Pre-disposers **'Six Ss'**: Syphilis, sepsis, sharp tooth
Smoking, spices, spirits

Path: **Chronic inflammatory hyperplasia of the superficial tissues of the tongue:**
(1) Hyperplastic and keratinised epith.
(2) Atrophy of papillæ
(3) Lymphocytic infiltration of the dermis
(4) Vacuolisation of Malpighian layer cells

Clinic: Stage (1): Enlarged papillæ
Stage (2): Butlin's 'white paint' tongue
Stage (3): Red glazed tongue
Stage (4): Cracks', fissures, ulcers and warts
: Leukoplakic patches:
(*a*) Network type
(*b*) White type
(*c*) Warty type

Compl: Carcinoma

Treat: (A) Conservative:
(*a*) Pot. chlor gargles
(*b*) Chromic acid paints · (dangerous)
(*c*) White vaseline smears
(B) Operative: **Butlin's operation:**
· Excision of affected mucous membrane of the tongue
(C) Radium
(D) Contact X Ray therapy

(4) ERYTHEMA MIGRANS:

Syn: Geographical tongue
Etio: Debilitated children
Clinic: Enlarging patches of smooth red areas with a life history of seven days.
Treat: (1) Astringent mouth washes
(2) Tonics

(5) GLOSSODYNIA EXFOLIATIVA

: Neuralgia of lingual nerve associated with thinning of the epithelium

(6) FURROWS OF THE TONGUE:

Varieties: (A) Natural: longitudinal
(B) Acquired. transverse
Etio: Chronic inflammation
Compl: Carcinoma
Treat: (*a*) Antiseptic mouth washes
(*b*) Chromic acid paints
(*c*) Ointments

(IV) ULCERS OF THE TONGUE:

(1) SIMPLE ULCER:

Etio: Chronic superficial glossitis

Treat (a) Mercurial purge
(b) Pot. chlorate gargles
(c) Quinine salicylate

(4) ABSCESS OF THE TONGUE

Etio (a) Trauma
(b) Acute parenchymatous glossitis
(c) Basal glossitis

Clinic Local inflammatory induration with no fluctuation

Treat Incision → evacuation → gargles

(5) GANGRENE OF THE TONGUE

Etio (1) Acute parenchymatous glossitis
(2) Syphilis and mercury
(3) Cancrum oris
(4) Ligature of both lingual arteries

(B) *CHRONIC GLOSSITIS*

(1) LOCAL INDURATIVE GLOSSITIS

Etio (1) **Septic tooth**
(2) **Wharton's duct calculus**

Clinic Chronic local glossitis around a focus

Compl (a) Ankyloglossia
(b) Carcinoma

Treat Treat the primary focus

(2) DYSPEPTIC TONGUE

Etio (a) Dyspepsia with constipation
(b) Idiosyncrasy to certain foods

Clinic Raw, beefy, excoriated tongue
With dyspeptic painful ulcers

Treat (a) Antiseptic gargles
(b) Chromic acid (10 grs to oz 1) paint
(c) Laxatives and intestinal antiseptics

(3) LEUKOPLAKIA **Chronic superficial glossitis**

Def (1) Chronic superficial glossitis with
(a) Patchy heaps of keratinised epith
(b) Atrophy of lingual papillæ
(c) Chronic inflam. of subjacent dermis
(2) An intractable form of chronic hyper plasia with a definite tendency towards cancerous change

Etio Sex Males
Age **After 30**

Pre-disposers **'Six Ss'**: Syphilis, sepsis, sharp tooth
Smoking, spices, spirits

Path: **Chronic inflammatory hyperplasia of the superficial tissues of the tongue:**
(1) Hyperplastic and keratinised epith.
(2) Atrophy of papillæ
(3) Lymphocytic infiltration of the dermis
(4) Vacuolisation of Malpighian layer cells

Clinic: Stage (1): Enlarged papillæ
Stage (2): Butlin's 'white paint' tongue
Stage (3). Red glazed tongue
Stage (4): Cracks', fissures, ulcers and warts
: Leukoplakic patches:
(a) Network type
(b) White type
(c) Warty type

Compl: Carcinoma

Treat: (A) Conservative·
(a) Pot. chlor. gargles
(b) Chromic acid paints: (dangerous)
(c) White vaseline smears
(B) Operative: **Butlin's operation:**
: Excision of affected mucous membrane of the tongue
(C) Radium
(D) Contact X Ray therapy

(4) ERYTHEMA MIGRANS.

Syn· Geographical tongue
Etio Debilitated children
Clinic: Enlarging patches of smooth red areas with a life history of seven days.
Treat. (1) Astringent mouth washes
(2) Tonics

(5) GLOSSODYNIA EXFOLIATIVA:

: Neuralgia of lingual nerve associated with thinning of the epithelium

(6) FURROWS OF THE TONGUE:

Varieties: (A) Natural: longitudinal
(B) Acquired. transverse
Etio: Chronic inflammation
Compl: Carcinoma
Treat: (a) Antiseptic mouth washes
(b) Chromic acid paints
(c) Ointments

(IV) ULCERS OF THE TONGUE:

(1) SIMPLE ULCER.

Etio. Chronic superficial glossitis

Site: Central
Clinic: Fissured or stellate
Treat: (A) Local applications:
(*a*) Chromic acid: 5–10 grs. per ounce
(*b*) Salicylic acid: 2 grs. per ounce
(*c*) Lactic acid: 5 grs. per ounce
(B) Excision

(2) DYSPEPTIC ULCER:
Etio: (*a*) Chronic dyspepsia
(*b*) **Anæmia**
(*c*) Idiosyncrasy: to certain articles of food
Site. (*a*) Apex of the tongue; (*b*) lips, (*c*) gums
Clinic: **Painful**, small, **circular**, punched out, **multiple** ulcers with red areola
Treat. (*a*) Antiseptic mouth washes
(*b*) Silver nitrate applications
(*c*) Anti-dyspeptic and laxative treatment

(3) TRAUMATIC OR DENTAL ULCER:
Etio: (*a*) **Bad tooth**, denture
(*b*) Œdematous tongue
Site. **Lateral margin**
Clinic **Chronic**, painful, **indurated**, œdematous, **sloughy**
Diff diag **Carcinoma**
Compl. **Carcinoma**
Treat. (*a*) **Extraction** of offending tooth
(*b*) Oral antisepsis
(*c*) Excision and **biopsy**

(4) SYPHILITIC ULCER.
(A) **Primary chancre:**
Clinic: (1) **Indolent indurative apical lesion**
(2) Acute œdematous **lymphadenitis**
(B) **Secondary ulcers:**
Clinic **Multiple**, shallow, **snail-track** ulcers on the sides and under surface of the tongue
(C) **Gummatous ulcers:**
Site. **Central**
Clinic. Single, painless, indurative
Treat: *(Of syphilitic ulcers of the tongue)*
(*a*) Mouth hygiene
(*b*) Anti syphilitic

(5) MERCURIAL ULCER:
Clinic: (*a*) **History** of mercurial intake
(*b*) Multiple, shallow, irregular ulcers
(*c*) Parenchymatous glossitis
(*d*) **Spongy gums** with loose teeth

Treat (1) Antiseptic mouth washes
(2) Pot chlorate internally
(3) No pot iodide

(6) TUBERCULOUS ULCER

Etio (a) Primary rare
(b) Secondary to (1) Late phthisis
(2) T B larynx

Site Lateral

Clinic (1) Soft shallow yellowish circular multiple very painful
(2) Phthisis

Treat (a) Lactic acid 50% paint
(b) Orthoform dusting

(7) CARCINOMATOUS ULCER

Etio **Chronic irritation** Mechanical or septic

Path (1) **Ulcerative carcinoma**
(a) Primary malignant ulcer
(b) Malignant degeneration of simple ulcer
(2) **Ulcerating carcinoma**
Carcinoma with secondary ulceration

Site Lateral border

Clinic (a) History of irritative focus bad tooth
(b) **Induration** Of base
(c) Eversion of margin
(d) Friability of surface
(e) Ankyloglossia

Clinical types (1) **Classical** type malignant ulcer
(2) **Doubtful** type chronic ulcer
(3) **Latent** type Diagnosed by biopsy only

Sp sign **Biopsy** Excise
(a) **Apparently normal surroundings**
+ (b) **Clinical margin**
+ (c) Affected tissue

(8) FRÆNAL ULCER

Etio (a) Operation for tongue tie
(b) Whooping cough
(c) Sepsis around Wharton s duct orifice

(9) HERPETIC ULCER

Clinic (a) Crops of I near vesicles → small ulcers
(b) Lingual neuralgia

(V) SPECIFIC DISEASES OF THE TONGUE

(1) SYPHILIS OF THE TONGUE

(A) Primary chancre

Clinic (a) Hard indolent indurated
(α) Nodule
(β) Ulcer
(γ) Fissure
+(b) Acute œdematous indurative lymphadenitis

(B) **Secondary lesions:**

Clinic (a) Snail track ulcers
(b) Mucous patches and nodules
(c) Hutchinson's median wart

(C) **Tertiary lesions:**

Clinic (1) General lesions
(a) Chronic superficial glossitis
(b) Chronic parenchymatous glossitis
(c) Macroglossia
(d) Fibrosed atrophic tongue
(2) Local lesions
(a) Leukoplakia
(b) Fissures
(c) Ulcers
(d) Gummata (α) Superficial
(β) Deep
Clinic (1) Central painless induration
↓ (2) Central painless ulcer

Diagnosis *(Of syphilitic lesion of the tongue)*
(a) Association with other stigmata
(b) Wassermann or Kahn
(c) Relative painlessness
(d) Reaction to treatment

(?) TUBERCULOSIS OF THE TONGUE

Clinic (a) Nodes
(b) Fissures
No associated phthisis
(c) Ulcers
(α) Soft shallow yellowish, circular
(β) Associated phthisis
(d) Lupus

Diagnosis (1) Very painful lesions
(2) Associated phthisis

Treat (a) Lactic acid 50% paint
(b) Orthoform dusting
(c) Anti tuberculous

(VI) MACROGLOSSIA:

Def Enlargement of the tongue

Varieties (A) **Inflammatory** · Acute parenchymatous glossitis
Etio (1) Sepsis
(2) Mercury
Clinic Acutely inflamed œdematous tongue
Compl (1) Œdema glottis
(2) Pneumonia

(B) **Syphilitic** Early parenchymatous glossitis

(C) **Mercurial** · (See above)

(D) **Muscular :**
Etio : Cretins and idiots
Path : Muscular hypertrophy
Compl : Dental ulcer

(E) **Lymphangiomatous :**
Clinic. (1) Diffuse enlargement of the tongue
(2) Minute surface vesicles
(3) Lymphorrhœa
Compl : Recurrent inflammatory attacks

(VII) TUMOURS OF THE TONGUE:

(A) INNOCENT TUMOURS.

(1) HÆMANGIOMA
Path varieties (*a*) Arterio venous aneurysm
(*b*) Cirsoid aneurysm
(*c*) Cavernous naevus
(*d*) Capillary nævus
Clinic Bleeding vascular growth
Compl : Hæmorrhage
Treat · (*a*) Diathermy large superficial growths
(*b*) Excision small nævi
(*c*) Radon seeds

(2) PAPILLOMA:
Etio (*a*) **Congenital**
(*b*) Chronic inflammatory
(*c*) Leukoplakic
Clinic : (1) Warty growth
(2) **No basal induration**
Sign **Biopsy**
Diff. diag. Carcinoma
Compl Malignancy
Treat (1) Excision : (*a*) Surgical
(*b*) Cautery :
(α) Sharp
(β) Coagulation
(2) Radium
(3) Contact X-Ray therapy

(3) LYMPHANGIOMA (See under Macroglossia)

(B) MALIGNANT TUMOURS:

(1) SARCOMA

(2) CARCINOMA TONGUE.
Etio : **Men between 40 and 60**
Pre disp : **Chronic irritation and inflammation**
'Seven Ss' : (1) Spices
(2) Smoking
(3) Spirits
(4) Silver nitrate : (caustics)

(5) Sepsis
(6) **Sharp tooth**
(7) **Syphilis**

Pre-cancers: (1) Chronic superficial glossitis:
(a) Hypertrophic
(b) Atrophic
(2) **Chronic local foci:**
(a) **Leukoplakia**
(b) Fissures
(c) **Ulcers**
(d) Warts
(e) Granulomata
(3) Benign tumours:
· Papillomata

Site: (1) **Ant. two-thirds of the lateral borders**
(2) Base
(3) Apex
(4) Under aspect—('Hidden' carcinoma)

Path: (A) **Primary:**
(a) **Squamous celled**
(b) Prickle or basal celled
(c) Lympho epithelioma
(B) **Secondaries:**
(1) **Lymphatics:**
(a) Apical set Bilateral
(b) Lateral set: Unilateral
(c) Median set Bilateral
(d) Basal set: Bilateral
(2) **Lymph glands:**
(a) Submental
↓ (b) Submaxillary
↓ (c) Superior deep cervical
↓ (d) Inferior deep cervical
(3) Bones
(4) Skin
(5) Viscera
} Rare (in radium treated cases)

Clinic: (A) Early: (1) **Tumour or ulcer:**
: indurated, friable
(2) Pain: local or referred
(3) Ankyloglossia
(B) Late: (4) Salivation
(5) Dysphagia
(6) Dysphonia
(7) Fœtor of breath
(8) Hæmorrhage
(9) **Lump in the neck**

Clinical types. (A) **Local:**

- (1) **Centrifugal:**
  - (*a*) Papillary warty
  - (*b*) Fungating cauliflower
  - (*c*) Nodular
- (2) **Centripetal:**
  - (*a*) Ulcerous
  - (*b*) *Fissured*

(B) Referred

- (1) **Neck tumour**
- (2) Referred pain

Diff diag (1) Syphilis (*a*) Chancre
- (*b*) Gumma
  - (α) Local
  - (β) Infiltrating
- (2) **Dental ulcer**
- (3) Leukoplakia
- (4) Papilloma

Sp sign **Biopsy**

Course Death within one year due to
- (1) Aspiration **pneumonia**
- (2) Cancerous and starvation **cachexia**
- (3) Secondary **hæmorrhage**
- (4) Asphyxia œdema glottis
- (5) Metastases

Prognosis Better in centrifugals than in centripetals

Treat (A) **Primary growth.**

- (1) **Radium:**
  - Ind (*a*) Base of the tongue
    - (*b*) Fungating growth
    - (*c*) Non involvement of bone
  - Tech *Interstitial needling*
  - Compl Necrosis jaw
- (2) Low voltage contact X Ray therapy
- (3) Diathermy excision
  - (*a*) Coagulation
  - (*b*) Cutting
- (4) **Surgical excision:**
  - Ind (*a*) Radium not available
    - (*b*) Tip carcinoma
    - (*c*) Invasion of the bone
    - (*d*) Good general condition
  - Pre treat. (1) Estimation of operability
    - (2) Estimation of general health

(5) Sepsis
(6) **Sharp tooth**
(7) **Syphilis**

Pre cancers (1) Chronic superficial glossitis
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(*b*) Atrophic
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(*b*) Fissures
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Papillomata

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(*b*) Fungating: cauliflower
(*c*) Nodular

(2) **Centripetal:**

(*a*) Ulcerous
(*b*) Fissured

(B) Referred:

(1) **Neck tumour**
(2) Referred pain

Diff. diag: (1) Syphilis: (*a*) Chancre
(*b*) Gumma:
(α) Local
(β) Infiltrating

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(3) Diathermy excision:

(*a*) Coagulation
(*b*) Cutting

(4) **Surgical excision:**

Ind: (*a*) Radium not available
(*b*) Tip carcinoma
(*c*) Invasion of the bone
(*d*) Good general condition

Pre-treat. (1) Estimation of operability
(2) Estimation of general health

(3) **Oral antisepsis**
(4) **Respiratory precautions**
(5) Blood transfusion

Pre procedures (*a*) Cervical block dissection
+ Ligature of lingual art
(*b*) Laryngotomy
With pharyngeal plug

Procedures (1) **Local excision:**
With healthy surroundings
(2) **Wedge resection:**
Of the tongue
(3) **Hemisection:**
Of anterior tongue
(4) **Total resection:**
Of anterior tongue
(*a*) Tongue alone
(*b*) With adherent bone
(5) **Complete excision:**
Of the tongue

Exposures (1) **Whitehead. Intrabuccal**
(2) Kocher Submaxillary
(3) Regnoli Submental
(4) Langenbeck Cheek split
(5) Syme Midline jaw cut
(6) Lateral division of jaw

Techniques (A) Buccal excision of primary
↓ Cervical glandular excision
or (B) Cervical glandular excision
+ Lingual arterial ligature
↓ Buccal excision of primary

Post treat (1) Prop up posture
(2) Mouth gargles and syringing
(3) Anti pneumonic treatment

(B) **Secondary cervical glands:**

(1) **Very early impalpable glands:**

Treat (*a*) **Deep X Ray** therapy
With close after watch
(*b*) Treat the primary

(2) **Operable glands:**

Ind (*a*) Primary treated or treatable
(*b*) Local operability
(*c*) General operability

Tech (1) **Unilateral block dissection**
(2) **Bilateral block dissection:**
Ind (*a*) Apical primary
(*b*) Median primary
(*c*) Basal primary

Tech : Two stage :
: Interval of 2/3 weeks.

Sequence : (1) **Preliminary :**
: To 'primary' treatment :
(a) With lingual art. ligat.
(b) Without ligature

(2) **Secondary :**
. To 'primary' treatment

(3) **Inoperable glands :**

Ind : (a) Wide skin involvement
(b) Adhesions to :
(α) Carotid artery
(β) Prevertebral fascia
(γ) Bone
(c) Implication of inf cervicals
(d) Untreatable primary

Treat. (1) **Deep X-Ray** therapy
(2) **Radium**

Post. oper. compl. (1) **Shock**
(2) **Hæmorrhage :** (a) Primary
(b) **Secondary**
: Beware of blood-stained saliva on 5th or 6th day.
(3) **Pulmonary :**
(a) **Aspiration pneumonia**
(b) Abscess or gangrene lung
(c) Empyema
(4) Cervical cellulitis
(5) Œdema glottis
(6) Osteomyelitis jaw
(7) **Recurrence**
(8) **Exhaustion :** Inanition
. Cachexia

(IX) IMPORTANT POINTS

(A) **The teeth :**

(1) Painful trismus in adolescents: ? Third molar trouble

(2) *Impacted and infected third molar is the most common cause of : (a) Trismus*
(b) Alveolar abscess
(c) Osteomyelitis jaw.

(3) Third molar should never be extracted when sepsis under the capuchon is fulminating, try conservative measures unless there is apical abscess.

(4) Re-implantation of a recently knocked out or extracted tooth is sometimes successful. Healthy mouth, clean unfractured tooth and young age are essentials for success.

(5) *Most common causes of alveolar sepsis*
 (a) *Dental caries*
 (b) *Pyorrhœa alveolaris*

(6) *Stuffing of a badly carious tooth carries a risk of peri-dental sepsis and its sequelæ*

(7) *In cases of acute apical abscess, the most effective treatment is immediate extraction of tooth*

(8) *An alveolar abscess should never be fomented and, as far as possible, not opened from outside, as inevitable discharging sinus on the face results*

(9) *Chronic root abscess is one of the noted primary septic foci in the body leading to unexplained and distant signs of toxæmia pyæmia or dyspepsia*

(10) Continued stagnation of food particles in the mouth leads to fermentation and the putrefaction leads to carious decalcification of the tooth enamel and to chronic inflammation of gum margins

(11) *Pyorrhea alveolaris must always be treated in every kind of chronic dyspepsias toxæmias and anæmias, and before every operation on the oral cavity and digestive tract*

(12) X-Ray picture in odontomes
 (a) Cavity at the root of a normal tooth
 ? Dental cyst
 (b) Cavity containing a non erupted tooth
 ? Dentigerous cyst
 (c) Multilocular central expansion
 ? Multilocular cystic disease
 ? Myeloma.

(13) Never place the forceps between the roots in extraction of upper or lower teeth

(14) Upper first premolar is the most difficult tooth to extract and one most liable to break

(15) *In extraction of the teeth*
 (a) *For upper teeth straight forceps*
 (b) *For lower teeth hawk bill forceps*

(16) *Severe or continued hæmorrhage after tooth extraction is a common emergency*

(B) **Jaw:**

(17) *Acute complications of acute osteomyelitis jaw*
 (a) *Septicæmia*

(b) *Pneumonia*
(c) *Cervical cellulitis and its sequelæ*

(18) *Septic tooth is the most common cause of jaw sepsis*

(19) In chronic osteomyelitis of the jaw
(a) Involucrum formation is very poor
(b) Separation of sequestrum is very slow

(20) Radium necrosis is the most chronic and most painful form of necrosis of lower jaw

(21) Most common new growths of the jaw
(A) Maxilla (a) Sarcoma
(b) Carcinoma (α) Palate
(β) Highmore
(B) Mandible (a) Extension carcinoma
(b) Epulides
(c) Odontoma.

(22) Common complications of jaw operations
(1) Shock
(2) Hæmorrhage primary or secondary
(3) Lung affections

(23) *Avoid opening into the oral cavity, as far as possible in operations on the jaw from outside but it is best to avoid outside operations on jaw*

(C) **Palate**

(24) Embryologically alveolus belongs to the lip rather than to the palate.

(25) *Practical classification of hare lip and cleft palate*
(1) *Pre alveolar*
(2) *Alveolar*
(3) *Post alveolar*

(26) Varieties of cleft palate
(1) Cleft soft palate
(a) Rudimentary uvula with short soft palate
(b) Bifid uvula
(c) Cleft soft palate
(2) Cleft hard palate
Premaxillary cleft (a) Unilateral
(b) Bilateral
(3) Cleft soft + hard palate
(a) Intermaxillary cleft
(Soft palate + posterior half of hard palate)
(b) Bipartite
(c) Tripartite
(4) Cleft (soft + hard) palate + hare lip
(a) Unilateral
(α) Unilateral hare lip
\+ (β) Bipartite cleft palate

(*b*) Bilateral ·
(α) Bilateral hare lip
\+ (β) Tripartite cleft palate

(27) *A long mobile soft palate in such a position as will provide an efficient oro nasal sphincteric control should be the main object of cleft palate surgery If the patient can speak clearly and do blowing tests which indicate good oro nasal sphincteric control, the operation is successful, no matter what the anatomical result is*

(28) Accuracy of speech production must be the standard by which surgical results of palatoplasty are judged.
Groups (1) Perfectly normal
(2) Nasal twang
(3) Consonant deficiency
(*p, t, k, ch, s, j z*)

(29) Successful operation
(*a*) Before third year normal speech in 98%
(*b*) After third year normal speech in 60%.

(30) Enumeration of operations for cleft palate

	Operation	*Technique*	*Remarks*
(1)	Brophy	Maxillary wiring	Bone necrosis
(2)	Lane	Muco periosteal flaps	Immobile soft palate
(3)	Langenbeck	Lateral incisions	Forward soft palate
(4)	Axhausen	(*a*) Bridge flap + (*b*) Cellophan	
(5)	Wardill	(*a*) Pharyngoplasty + (*b*) Palatoplasty	
(6)	Dorrance	Push back	Severe
(7)	Veau	Vomerine flap	Mid hole
(8)	Gillies Fry	(*a*) Soft palatoplasty + (*b*) Obturator	Changing obturator

(31) Secondary procedures
(1) Relaxation of tension
(A) Push back
(B) Veau s (*a*) V flap
(*b*) Vomerine flap
(C) Wardill's four flaps
(2) Veau's or Axhausen s three layer sutures
(*a*) Nasal mucosa
(*b*) Soft palate muscles
(*c*) Buccal mucosa
(3) Oro nasal isthumus narrowing
(A) Wardill s pharyngoplasty
(B) Dennis Browne s
(*a*) Ring suture
(*b*) Fracture of hamulus tip

(c) Muscle transplantation
(Medial displacement of separated lateral palatal muscles)

(32) *Some essential points in palatoplasty*
(1) *Operation before child learns to talk*
(2) Good general condition
(3) Good anæsthesia
(4) *Absolute absence of tension on soft parts*
(a) Complete separation of
(α) Muco periosteum from hard palate
(β) Soft palate from hard palate
(γ) Lateral palatal muscles from internal pterygoid plate
(b) Fracture of hamular processes
(5) Good vascular supply to soft tissue flaps
Save the palatine vessels
(6) *No strain on suture lines*
(7) Three layer sutures
(8) *Long mobile soft palate or forward pharyngeal wall*
(a) Push back
(b) Pharyngoplasty
(c) Ring suture
(9) Efficient vocal rest for three weeks after operation
(10) *Post operative vocal training*

(33) Failure of cleft palate operation
(1) Anatomical failure
Recurrence of the cleft giving way of sutures
(2) Functional failure
(a) Anatomical failure
(b) Immobile, scarred, short, forward soft palate
(c) Too late operation
(d) Inefficient vocal training

(34) A palate that fails to heal following the initial operation will become much harder to repair in subsequent operations

(35) *Common causes of perforation palate*
(1) *Gumma*
(2) *Carcinoma*
(3) *Post operative cleft*

D) Mouth cavity and the tongue :

(36) Lymphatics of the tongue
(A) Lymph zones
(a) Apical bilateral
(b) Lateral unilateral
...tral bilateral
bi...

(B) Lymph glands (a) Submental
(b) Submaxillary
(c) Deep superior cervicals
Jugulo digastric
(d) Inferior cervicals
Jugulo omohyoid

(37) Beware of operating on a tumour at the base of the tongue it may be lingual thyroid

(38) Hæmorrhage from the tongue
(1) Pull on apical anchor stitch
(2) Heath hook forwards the lingual base together with the hyoid by the fore finger
(3) Under running suture
(4) Ligature of (a) Lingual artery
(b) External carotid artery

(39) In local stomatitis find out and treat the cause

(40) Stomatitis and dry mouth are important etiological factors in the causation of sialo adenitis

(41) *Beware of cancrum oris in a marasmic child during or after any acute illness*

(42) *In any acute inflammatory focus of the tongue or oro pharynx, beware of*
(a) *Œdema glottis*
(b) *Aspiration pneumonia*
(c) *Secondary hæmorrhage*

(43) *Mouth hygiene must be scrupulously attended to*
(a) *Before and after an operation on*
(α) *Oral cavity*
(β) *Pharynx*
(γ) *Digestive system*
(b) *Where nothing is allowed by the mouth*
(α) *Expectant treatment of acute abdomen*
(β) *Post-operative treatment of abdominal oper*
(γ) *Mechanical alimentary obstruction*
(c) *Sepsis of*
(α) *The oral cavity*
(β) *Pharynx*
(γ) *Digestive system*

(44) Syphilis of the mouth and tongue
(A) Chancre (a) Lips
(b) Tongue.
(B) Secondary (a) Erosive syphilide or mucous patch
(b) Chronic leukoplakic glossitis
(C) Tertiary (a) Gumma of the tongue
(1) Local (α) Superficial
(β) Deep

(2) Diffuse
(b) Perforation of the palate
(c) Fournier's malperforant buccal
(α) Falling teeth
(β) Alveolar absorption
(γ) Maxillary antrum necrosis.

(45) *Most common intra oral syphilitic lesions*
(1) *Chancre lip or tongue*
(2) *Secondary syphilitic ulcers*
(3) *Mercurial stomatitis*
(4) *Gumma tongue*
(5) *Gummatous perforation of the palate*

(46) *Any indolent lesion on the lip or apex of the tongue, do not forget chancre*

(47) *Iodides and mercury are contraindicated in ulcers of the tongue even in the presence of positive Wassermann*

(48) Cysts in the floor of the mouth
(A) Buccal (a) Mucous
(b) Ranula (α) Simple
(β) Deep
(B) Bucco cervical (a) Dermoid
(b) Thyroglossal cyst

(49) Ranula or mucous cysts are translucent and contain glairy fluid while dermoids are opaque and contain sebaceous material

(50) Benign tumours of the mouth and tongue
(1) *papillomata* (a) Congenital
(b) Inflammatory
(c) Leukoplakic
(2) Mucous and salivary mixed tumours
(3) Lipoma
(4) Chondroma
(5) Osteoma
(6) Rhabdomyoma
(7) Fibroma (a) Simple
(b) Neuro fibroma
(c) Xanthoma
(8) Angioma (a) Capillary
(b) Cavernous
(9) Lymphangioma Macroglossia
(10) *Epulis* (a) Fibrous
(b) Fibro angiomatous
(c) Giant celled
(11) Lingual thyroid

(51) Malignant tumours of
(1) *Carcinoma* (a)
(b)

(c) Cheek
(d) Palate
(e) Floor of the mouth

(2) Sarcoma.

(52) *Most common malignant tumour of the mouth cavity is squamous carcinoma of the tongue*

(53) Most common precancerous lesions of the tongue
(a) Dental ulcer
(b) Leukoplakia
(c) Papilloma
(d) Gumma.

(54) Positive Wassermann does not exclude malignancy Syphilitic mouth and tongue are the most fertile soil for the development of cancer

(55) Intra buccal and tongue papillomata undergo malignant degeneration by
(a) Frequent application of caustics
(b) Inadequate radium therapy

(56) *No caustics have any place in the treatment of tongue lesions,* especially chronic except a dyspeptic ulcer, where silver nitrate is occasionally used

(57) Labio alveolar carcinoma is common in pāan or betel nut chewers

(58) *Any chronic localised abnormality of the tongue after the age of 35 is carcinoma unless proved otherwise by biopsy*

(59) Earliest evidence of malignant degeneration of a papilloma is basal induration and surface friability

(60) *The most common lesions to be diagnosed from carcinoma tongue, are*
(a) *Dental ulcer*
(b) *Papilloma*

(61) *Never omit a biopsy in every chronic focus in the oral cavity or on the tongue especially after the age of 35 Biopsy is the only certain method in the differential diagnosis and must be resorted to as early as possible*

(62) Eradication of precancerous conditions and earliest possible identification of an epithelioma of the tongue are very important.

(63) Treatment of intra buccal carcinoma

Primary		*Lymph metastases*
(A) Excision	+	Dissection
(B) Radiotherapy	+	Dissection
(C) Radiotherapy	+	Radiotherapy

(64) Treatment of tongue carcinoma

- (A) Primary
  - (1) Surgical excision (*a*) Knife
    - (*b*) Cautery
  - (2) Radium
- (B) Metastases
  - (1) Surgical excision
  - (2) Radiotherapy

(65) Precedence of stages

- (A) Robust patients
  - Block dissection of cervical glands
  - ↓ Irradiation or surgery of the tongue
- (B) Poor operative risks +/or impalpable glands
  - Irradiation or surgery of the tongue
  - ↓ Constant observation of the neck
  - ↓ Block dissection of cervical glands
    - (*a*) If necessary
    - \+ (*b*) Improved general condition

(66) Three ways of exposure in lingual carcinoma

- (1) Intra buccal (*a*) Whitehead
  - (*b*) Langenbeck
- (2) Cervical (*a*) Kocher
  - (*b*) Regnoli
- (3) Combined bone method (*a*) Syme
  - (*b*) Lateral jaw cut

(67) Preliminary ligature of lingual or ext carotid artery is indicated before the excision of advanced carcinoma tongue and should be done in conjunction with cervical block dissection as a preliminary step to surgical treatment of the primary

(68) *Every case of intra oral carcinoma should have some form of treatment to the cervical lymphatic area, even when there are no clinically palpable glands*

- (A) Radium or X Rays
  - Ind (*a*) Impalpable early glands
    - (*b*) Inoperable glands
    - (*c*) Inoperable primary
- (B) Dissection
  - Ind (*a*) Operable glands
    - (*b*) Operable primary

(69) Beware of necrosis jaw in radium treatment of intra oral carcinoma.

(70) *Beware of (a) avulsion of a tooth and (b) dislocation of the jaw in application of a mouth gag under anaesthesia*

(71) *Best way of treating anaesthetic trismus is to give more anaesthesia*

(72) In every operation on oropharynx, pass in an anchor stitch through the apex of the tongue and keep it during and after the operation, till the patient is out of anæsthesia

(a) To prevent asphyxia

(b) To check hæmorrhage from the tongue

(73) Take care of Wharton's duct in operations on the tongue or floor of the mouth, especially for ranula or tongue tie, to avoid stricture and resultant sialo adenitis

(74) Post operative treatment in tongue operations

(1) Mouth antisepsis

(2) Respiratory precautions

(a) Prop up posture changing

(b) Antiseptic inhalations

(c) Thoracic applications stupes

(d) Expectorant stimulants

(3) Blood transfusion if necessary

(75) In the post operative period in oropharyngeal cases, look for (1) Asphyxia

(2) Pneumonia

(3) Secondary hæmorrhage

(76) *Blood stained saliva on the 5th or 6th day of oropharyngeal operation or sepsis, may be a death warrant—a precursor of massive secondary hæmorrhage*

(77) Regurgitation through the nose or nasal voice

? (1) Congenital short or cleft palate

? (2) Perforation palate

? (3) Post-diphtheretic paralysis of palate.

(78) Local applications in tongue lesions

(A) Apply (a) Chromic acid

(b) Lactic acid

(c) Salicylic acid

(d) Tannic acid

(e) Sterile vaseline.

(B) Avoid Silver nitrate and other caustics.

(79) Internal therapy in tongue lesions

(A) Allow (a) Pot. chlorate

(b) Laxatives

(c) Intestinal antiseptics

(B) Avoid (a) Iodides

(b) Mercury

CHAPTER II

THE SALIVARY GLANDS

(I) TRAUMA:

(1) TRAUMA TO THE PAROTID.

Etio: (a) Stabs
(b) Operative incisions

Clinic. Saliva in the discharge

Compl. (a) **Salivary fistula**
(b) **Facial nerve injury**

Treat. Sutures passing down the whole depth

(2) TRAUMA TO STENSEN'S DUCT

Etio Wounds or operations of the cheek

Clinic: Salivary discharge

Compl. (a) Salivary **fistula**
(b) **Stricture** with chronic parotitis

Treat (a) Primary suture over thick silkworm gut
(b) Proximal ligature

(3) TRAUMA TO WHARTON'S DUCT

Etio. Operations for ranula or tongue tie

Clinic: **Nil**

Compl Stricture → chronic sialo adenitis

Treat (a) Bougie dilatation
(b) Excision of submaxillary gland

(II) INFLAMMATIONS OF THE SALIVARY GLANDS:

(A) *Acute inflammations*.

(1) ACUTE SEPTIC PAROTITIS

(a) **Ascending septic parotitis:**

Etiology.

Pre disp (a) Oral **sepsis:**
. Near duct orifice (septic tooth)
{ (b) Oral **dryness**
{ (c) Oral **stasis**

Exciting (1) **Oro-pharyngeal and alimentary operations**
(2) Stomatitis
(3) Acute infective toxæmia

Clinic. (a) Acute spasmodic **trismus**
(b) **Inflammatory swelling of parotid:**
(α) Unilateral
↓ (β) Bilateral

(c) **Inflamed duct orifice**

Diff diag (1) Cellulitis face
(2) Osteomyelitis jaw
(3) Lymphadenitis
(4) Tetanus (trismus)

Compl (a) Parotid **abscess**
(b) Salivary **fistula**
(c) Facial paralysis post operative
(d) Cavernous sinus thrombosis
(e) Cervical cellulitis → œdema glottis

Treat (1) Oral antisepsis boroglycerol **gargles**
(2) **Sialogogues** lemon to the tongue
chewing gum
plenty of fluids
(3) Drugs Lugol s iodine m xv
Sulphonamide
(4) Artificial hyperæmia
Elastic band around the neck
(5) X Ray therapy

(b) **Parotid abscess**

Clinic (1) **Non abatement of signs and symptoms of acute parotitis at the end of five days**
(2) Pitting on pressure
(3) *No* **fluctuation** Until subcutaneous

Treat (1) **Incision and drainage**
Ind (a) Non abated signs at the end of five days
\+ (b) Local œdema
\+ (c) High temperature
Tech (A) Incisions parallel to nerves
↓ Hilton s method
↓ Drainage
or (B) **Blair s method**
(2) Regional oral antisepsis sialogogues
(3) General Sulphonamide

(c) **Fulminating or necrosing parotitis**

Clinic (1) Acute pain
(2) Pronounced toxæmia

Compl Parotid sloughing

Treat **Blair s parotid decompression**

(2) ACUTE EPIDEMIC PAROTITIS MUMPS

Etio Infectious incubation 3–30 days

Path Interstitial and peritubular exudative and hæmorrhagic inflammation

Clinic Consecutively bilateral **non suppurating**

Compl (a) Epididymo **orchitis**.

(α) Atrophy testis

(β) Sterility without impotence

or (a) Ovaritis

(b) Mastitis

(c) Pancreatitis → diabetes

(d) Nervous complications

(α) Meningitis

(β) Encephalitis

(γ) Polyneuritis

Treat Symptomatic

(3) SUBMAXILLARY SIALO ADENITIS

Etio (a) Same as parotitis

(b) Exacerbation on chronic

Clinic (a) Inflammation in the submaxillary area

(b) **Inflamed Wharton's duct orifice**

Diff diag (1) **Submaxillary lymphadenitis**

(2) **Osteomyelitis jaw**

(3) Ludwig s angina

Compl Submaxillary cellulitis

↓ Œdema glottis

Treat (a) Acute stage Conservative

(b) Abscess Drainage

(c) Sequelæ Excision

(B) *Chronic inflammations*

CHRONIC SEPTIC SIALO ADENITIS

Etio (a) **Secondary** to acute inflammation

(b) Sepsis near the duct orifice **ascending**

(c) **Calculus**

(d) **Stricture duct**

Clinic (1) Chronic **tender enlargement**

\+ (2) Inflamed and **discharging duct orifice**

(3) Recurrent acute or subacute exacerbations

Diff diag (a) Chronic lymphadenitis

(b) Chronic bone infection

(c) Salivary calculus

(d) Mixed salivary tumour

Compl Salivary fistulæ

Treat (1) Oral hygiene

(2) Salivary drainage sialogogues

(*c*) **Inflamed duct orifice**

Diff diag (1) Cellulitis face
(2) Osteomyelitis jaw
(3) Lymphadenitis
(4) Tetanus (trismus)

Compl (*a*) Parotid abscess
(*b*) Salivary fistula
(*c*) Facial paralysis post operative
(*d*) Cavernous sinus thrombosis
(*e*) Cervical cellulitis → œdema glottis

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(2) **Sialogogues** lemon to the tongue
chewing gum
plenty of fluids
(3) Drugs Lugol s iodine m xv
Sulphonamide
(4) Artificial hyperæmia
Elastic band around the neck
(5) X Ray therapy

(*b*) **Parotid abscess**

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(2) Pitting on pressure
(3) **No fluctuation** Until subcutaneous

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Ind (*a*) Non abated signs at the end of five days
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(2) Regional oral antisepsis sialogogues
(3) General Sulphonamide

(*c*) **Fulminating or necrosing parotitis**

Clinic (1) Acute pain
(2) Pronounced toxæmia

Compl Parotid sloughing

Treat **Blair s parotid decompression**

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Etio Infectious incubation 3-30 days

Path Interstitial and peritubular exudative and hæmorrhagic inflammation

Clinic: Consecutively-bilateral **non-suppurating**

Compl: (*a*) Epididymo **orchitis**:

(α) Atrophy testis

(β) Sterility without impotence

or (*a*) Ovaritis

(*b*) Mastitis

(*c*) Pancreatitis → diabetes

(*d*) Nervous complications:

(α) Meningitis

(β) Encephalitis

(Γ) Polyneuritis

Treat. Symptomatic

(3) SUBMAXILLARY SIALO ADENITIS.

Etio. (*a*) Same as parotitis

(*b*) Exacerbation on chronic

Clinic: (*a*) Inflammation in the submaxillary area

(*b*) **Inflamed Wharton's duct-orifice**

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(2) **Osteomyelitis jaw**

(3) Ludwig's angina

Compl Submaxillary cellulitis

↓ Œdema glottis

Treat. (*a*) Acute stage Conservative

(*b*) Abscess Drainage

(*c*) Sequelæ. Excision

(B) *Chronic inflammations.*

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Etio. (*a*) **Secondary** to acute inflammation

(*b*) Sepsis near the duct orifice **ascending**

(*c*) **Calculus**

(*d*) **Stricture duct**

Clinic: (1) Chronic **tender enlargement**

+ (2) Inflamed and **discharging duct-orifice**

(3) Recurrent acute or subacute exacerbations

Diff. diag. (*a*) Chronic lymphadenitis

(*b*) Chronic bone infection

(*c*) Salivary calculus

(*d*) Mixed salivary tumour

Compl. Salivary fistulæ

Treat: (1) Oral hygiene

(2) Salivary drainage: sialogogues

(3) Dilatation of the duct probing
(4) Excision in submaxillary gland

(III) SALIVARY CALCULUS:

Etio (1) Salivary **stasis** stricture duct
(2) Chronic **sialo adenitis**

Site (*a*) **Submaxillary** gland or duct
(*b*) Parotid gland or duct in Sudan

Path (1) Composition calcium carbonate
(2) Situations (*a*) Gland tissue
(*b*) Duct lumen

Clinic (1) Chronic inflammatory tender enlargement of the
(2)
(3)
(4)
(*b*) *At meals*
(5) **X Ray** (*a*) Plain
(*b*) Sialography lipoidol

Diff diag (*a*) **Lymphadenitis**
(*b*) Submaxillary cellulitis
(*c*) Mixed tumour

Compl (*a*) **Chronic sialo adenitis**
(*b*) Acute sialo-adenitis with abscess
(*c*) Salivary fistula

Treat (A) Gland calculus
(*a*) External incision and removal
(*b*) Excision of the gland submaxillary
(B) Duct calculus
(*a*) *Dilatation and removal*
(*b*) Buccal incision and removal

(IV) SALIVARY FISTULA

Etio (1) **Trauma** Stabs and operative incisions
(2) Salivary **abscess or calculus**
(3) Sloughing or ulceration of surrounding tissues Cancrum oris

Site **Parotid** gland and Stensen s duct

Path (1) Gland fistula
(2) Duct fistula (*a*) Pre masseteric
(*b*) Masseteric

Clinic (1) **Internal**· No signs
(2) **External** Out pouring saliva
(3) X Rays Sialography

Compl (*a*) Inconvenience
(*b*) Skin irritation → eczema

Treat: (A) **Gland fistula:**
- (*a*) Scraping or cauterizing
- (*b*) Excision and obliterating sutures
- (*c*) Radiotherapy . radium or deep X Ray.
- (*d*) Auriculo temporal avulsion

Sequela . facial deformity

(B) **Duct fistula:** Turn external into internal
- (*a*) Premasseteric
  : Pearce Gould's silver seton
- (*b*) Masseteric .
  Kaufmann's rubber tube
- (*c*) Saposchkoff

(V) TUMOURS OF THE SALIVARY GLANDS:

(1) MIXED SALIVARY TUMOUR.

Etio. Age 20–40
Sites. (1) **Parotid**
> (2) Submaxillary
> (3) Intra buccal. mixed molar tumour

Path · (*a*) Origin (1) **Epithelial: adenoma**
(2) Endothelial
(3) Embryonic

(*b*) Composition : Myxomatous to cartilaginous

Clinic: Hard–fleshy–soft
Lobulated
Encapsuled
Non-tender
Mobile
} . **tumour**

(*a*) Parotid
- (α) Filling of the space between the angle of the jaw and the mastoid
- +(β) **External displacement of ear lobule**

(*b*) Submaxillary
. Lobulated swelling in submaxillary region

Special: (1) Progressive enlargement
(2) **Recurrence** after removal
(3) Malignant degeneration .
- (*a*) Recurrence
- (*b*) Rapid growth
- (*c*) Surrounding infiltration
- (*d*) Facial paralysis

Treat: (1) **Early enucleation → Radium**
(2) Radium
(3) Excision of the gland . submaxillary

Post. compl: (*a*) Facial paralysis
(*b*) **Salivary fistula**
(*c*) Deformity

(*d*) **Recurrence**
(*e*) Malignancy

(2) CARCINOMA PAROTID:

Etio Mixed parotid tumour

Path (*a*) Primary adeno carcinoma.
Metastases usual
(*b*) Secondary to mixed tumour.
Metastases unusual
(*c*) Infiltration from surrounding carcinoma:
Cheek, alveolus

Clinic (1) Tissue infiltration immobility, adhesions
(2) Fungation with everted borders
(3) **Facial paralysis**

Treat (*a*) **Radium or Radon**
(*b*) Deep X Ray therapy
(*c*) Surgical excision

(VI) MISCELLANEOUS DISEASES:

(1) ACUTE EMPHYSEMA OF THE PAROTID.

Etio Glass blowers
Wind instrument players

Clinic Crepitant swelling

(2) VON MIKULICZ DISEASE

Def *Generalised enlargement of all salivary and lachrymal glands*

Path (*a*) Chronic inflammation
(*b*) Benign neoplasm

(VII) SPECIAL PROCEDURES AND OPERATIONS:

(1) SIALOGRAPHY

Def Radiographic demonstration of the ducts of the salivary glands after injection of lipoidol

Ind Any chronic abnormality of salivary glands
(*a*) Chronic inflammations
(*b*) Calculi
(*c*) Fistula
(*d*) *New growths*

Tech (1) *5 to 1 c.c. of lipoidol injected into the duct* orifice by (*a*) Syringe
(*b*) Payne's rubber bulb
↓ (2) X Ray film

(2) BLAIR'S PAROTID DECOMPRESSION

Tech (1) Incision. **Vertical,** in front of the ear
. Zygoma to mandibular angle
: **Down to parotid fascia**
↓ (2) Retraction of undermined ant. skin flap
↓ (3) **Transverse incisions in the capsule**

↓ (4) Hilton's method
↓ (5) Leave the wound open

(3) AURICULO-TEMPORAL AVULSION :

Tech : (1) Incision : vertical
: anterior to ext. aud meat...
(2) Isolation of the nerve
(3) Division of the nerve
(4) Avulsion by traction with Spencer Wells

(4) EXCISION OF THE SUBMAXILLARY GLAND.

Ind : Any chronic lesion

Anæsth : Regional infiltration :
: Midpoint of post. border of sternomastoid

Tech : (*a*) Incision : Symphysis
↓ *Hyoid*
↓ 1" below mandibular angle
(*b*) Incision of platysma
(*c*) Incision of gland capsule
(*d*) Blunt dissection of the gland
(*e*) Ligature : (α) Facial vessels, if necessary
(β) Wharton's duct
(*f*) Separate suture of platysma
(*g*) Suture skin

Post. compl : (1) Hæmatoma
(2) Paralysis of cervical branch of facial nerve
(3) Salivary fistula

(VIII) IMPORTANT POINTS

(A) **Trauma :**

(1) *In every case of stab wound of the cheek, explore Stensen's duct.*

(2) One of the chief complications of parotid trauma is salivary fistula

(3) Trauma to the Wharton's duct is a complication of .
(*a*) Tongue tie operation
(*b*) Ranula operation.

(B) **Inflammations :**

(4) Beware of parotitis in .
(*a*) Mouth stasis + sepsis
(*b*) Oro pharyngeal and alimentary operations
(*c*) Acute toxæmic states

(5) Keep an eye on parotids in the after-treatment of laparotomies, especially for obstructive lesions.

(6) *A lemon to suck will prevent post-operative parotitis in majority of cases.*

(7) *A rise in temperature or stiffness about the jaw three or four days after an abdominal operation denotes parotitis*

(8) Parotid abscess
  (a) Do not wait for fluctuation
  (b) Incise if signs persist after fifth day
  (c) Incisions parallel to facial branches
  (d) Hilton's method
  (e) Blair's decompression in fulminating cases.

(9) Mumps
  (a) One attack of mumps confers permanent immunity
  (b) Suppuration is rare
  (c) *Modern view is that mumps is primarily a disease of the nervous system due to neurotropic virus*
  (d) Complications of mumps may precede the appearance of mumps themselves.

(10) *Submaxillary sialo adenitis can be diagnosed from lymphadenitis, cellulitis or osteomyelitis by absence of trismus*

(C) Salivary fistula:

(11) Salivary fistula is a likely complication of any trauma, infection or operation of a salivary gland or its duct

(12) Avoid injury to the salivary ducts in operations on the cheek and the floor of the mouth

(13) In every case of trauma to the face or mouth, exclude implication of salivary ducts

(14) Fistulæ of submaxillary and sublingual glands do not require any treatment as a rule.

(15) *Treatment of an external salivary duct fistula is to turn it into an internal or buccal fistula*

(D) Salivary tumours:

(16) *Most common tumour of the parotid is mixed tumour*

(17) Pathognomonic signs of mixed parotid tumour are.
  (a) Filling up of the hollow between the jaw angle and the mastoid
  (b) *Lateral deviation of the ear lobule*
  (c) Lobulations of the tumour

(18) Biopsy is not to be recommended in mixed salivary tumours.

(19) Mixed parotid tumour is midway between innocent and [illegible]
  (a [illegible]
  (b) [illegible]
  (c) *Sudden infiltration*

(20) Radiotherapy must always follow the removal of a mixed parotid tumour.

(21) *Pathognomonic sign of parotid malignancy is facial nerve paralysis due to nerve infiltration*

(E) Miscellaneous:

(22) Differential diagnosis between chronic sialo adenitis and mixed tumour of a submaxillary gland, is the presence of tenderness in the former

(23) *Most common post-operative complications in the parotid region are.*
   (*a*) *Salivary fistula*
   (*b*) *Facial paralysis*

(24) Indications for deep X Ray therapy in parotid lesions
   (*a*) Ptyalism
   (*b*) Salivary fistulæ
   (*c*) Malignancy

(25) Chief conditions to be differentially diagnosed are
   (*a*) Lymphadenitis
   (*b*) Cellulitis } Trismus
   (*c*) Osteomyelitis jaw
and (*d*) Sialo adenitis Trismus present in parotid
absent in submaxillary

CHAPTER III

THE ŒSOPHAGUS

(I) CONGENITAL AFFECTIONS:

(1) Total absence
(2) Bifurcation
(3) Atresia with œsophago-tracheal fistula
(4) Valves or membrane
(5) Stenosis
(6) Diverticulæ
(7) Mega-œsophagus
Def Enormous dilatation and tortuosity of œsophagus
Clinic Dysphagia
Sign Barium meal
(8) Short œsophagus with thoracic stomach

(II) TRAUMA:

(1) RUPTURE ŒSOPHAGUS:

Etio: Chronic alcoholism
Cause: Vomiting
Clinic: (a) Painful dysphagia
+ (b) **Gastric perforation syndrome**
or (b) Pneumothorax
or (b) Mediastinal emphysema
Diff. diag: Gastric perforation
Compl: Cervical or mediastinal sepsis
Treat (A) Trans pleural exploration
↓ Repair œsophagus
↓ Drainage of peri œsophageal spaces
+ (B) Gastrostomy

(2) *INJURIES OF THE ŒSOPHAGUS:*

(A) **From without:**

Etio Stab-wounds neck
Clinic: Discharge of saliva from the wound
Compl. Cervical or mediastinal sepsis
Treat: Repair + drainage + temporary gastrostomy

(B) **From within:**

Etio: (a) Impacted sharp foreign bodies
(b) Faulty instrumentation
Clinic: (1) Painful dysphagia
(2) *Hæmatemesis*

Prophylaxis: (*a*) Exclude before instrumentation
(α) **Thoracic aneurysm**
(β) Cardio vascular disease
(γ) Renal disease
(*b*) Never use force
(*c*) Pass the instrument under direct vision

(3) FOREIGN BODIES IN ŒSOPHAGUS

Objects: Toys, pins, coins, false teeth, instruments

Sites: (*a*) 7" from teeth commencement
(*b*) **Episternal notch**
(*c*) 11" from teeth bronchial crossing
(*d*) 17" from teeth. cardiac orifice

Clinic: (1) History (*a*) Absent in children and insane
(*b*) Present in adults and sane
(2) Dyspnœa + dysphagia
↓ (3) **Dysphagia** only
(4) X Rays

Compl. (*a*) Ulceration
↓ (*b*) Perforation (α) Peri œsophageal cellulitis
(β) Respiratory complications
(γ) Fatal hæmatemesis
or (*c*) Passage into stomach
(*d*) Stricture œsophagus

Treat: (A) Upto cricoid *7" from teeth*
: Extraction through the mouth by
(*a*) : **Coin-catcher**: Under X Ray screen
or (*b*) **Œsophagoscope**: under direct vision
(B) Upto 6" below cricoid *13" from teeth*
(*a*) Extraction *via* cervical **œsophagotomy**
(*b*) Extraction by œsophagoscope
(C) *Beyond 13" from teeth:*
(*a*) Extraction through **gastrotomy**
(*b*) Extraction by œsophagoscope

(III) OESOPHAGITIS:

(1) ACUTE ŒSOPHAGITIS.

Etio: (*a*) Acute specific fevers
(*b*) Corrosive burns
(*c*) Impacted foreign bodies
(*d*) Infantile: oral infection
(α) Diphtheritic
(β) Vincent's
(γ) Thrush:
Treat: Application of 1% aqueous solution of gentian violet

(2) CHRONIC ŒSOPHAGITIS

Etio (*a*) Chronic alcoholism
(*b*) Stricture
(*c*) Diverticulum

(IV) ULCERS OF THE OESOPHAGUS:

(1) TRAUMATIC

Etio (*a*) Burns
(*b*) Impacted foreign bodies

(2) TUBERCULOUS

Etio Associated with advanced phthisis

(3) SYPHILITIC

Clinic (*a*) Dysphagia in a syphilitic patient
(*b*) Therapeutic test
(*c*) Positive Kahn

Diff diag Carcinoma œsophagus

(4) PEPTIC

Etio Regurgitation of gastric juice
Site Cardiac end
Clinic (*a*) Pain immediately after food
(*b*) Dysphagia painful
(*c*) Vomiting
(*d*) Hæmorrhage in vomits and stools
Signs (*a*) Œsophagoscopy
(*b*) X Rays
Diff diag (1) Carcinoma œsophagus
(2) Non malignant ulcers or stricture
(3) Gastric ulcer
(4) Heart lesions
Compl (*a*) Hæmorrhage
(*b*) Perforation with its sequelæ
(*c*) Stricture
Treat (1) Conservative rest + diet + alkalies
(2) Operative temporary gastrostomy

(5) CARCINOMATOUS (See under New Growths)

(V) PERFORATIONS OF THE OESOPHAGUS:

Etio (*a*) Traumatic foreign bodies
(*b*) Ulceration
(*c*) Carcinoma
Site Upper part
Clinic (1) History of trauma (in a)
(α) Ingestion of sharp foreign body
(β) Instrumentation
(2) Pain + dysphagia + tenderness

(3) Pyrexia + swelling + emphysema
(4) Radiography
(5) Œsophagoscopy

Compl (a) Mediastinitis
(b) Emphysema or pneumothorax
(c) Hæmatemesis

Treat. **Incision and drainage:** Of peri œsophageal tissues

Tech (In Superior Mediastinum)
(a) Incision along ant. border of sternomastoid
(b) Retraction of thyroid gland
(c) Drainage of fascial planes

Post. compl (1) Broncho pneumonia
(2) Secondary hæmorrhage

(VI) OESOPHAGEAL OBSTRUCTION: DYSPHAGIA

(A) LUMEN OBSTRUCTION

Etio Foreign bodies (See above)

(B) WALL OBSTRUCTION

(a) **Spasmodic:**
(1) Globus hystericus
(2) Cardiospasm.

(b) **Paralytic:**
(α) Diphtheria
(β) Glosso pharyngeal paralysis
(γ) Post lacerate foramen syndrome

(c) **Cicatricial**

(d) **New growths:**
Carcinoma (See under New Growths)

(e) **Diverticulæ**

(C) EXTRINSIC OBSTRUCTION

(a) **Aortic aneurysm:**

Etio Syphilis

Clinic Dysphagia
Dyspnœa + cyanosis
Hoarse voice

N B **Exclude aortic aneurysm before œsophageal instrumentation**

Compl Rupture -> hæmatemesis

(b) **Mediastinal tumours:**
(α) Retro sternal goitre
(β) Enlarged thymus

(c) **Enlarged mediastinal lymph glands:**
(α) Tuberculosis
(β) Lymphadenoma
(γ) Lympho sarcoma
(δ) Leukæmia

(*d*) **Mediastinal abscess** T B spine
(*e*) **Diaphragmatic hernia**

(VII) CICATRICIAL STENOSIS OF THE OESOPHAGUS

Causes (1) **Traumatic** (*a*) Caustics
(*b*) Impacted foreign bodies
(2) **Ulcerative** fibrosis (See under Ulcers)
(3) **Syphilis**
(4) **Carcinomatous**

Sites Three anatomical constrictions

Clinic (*a*) **Painless, progressive dysphagia**
(*b*) **History of etiology**
(*c*) Œsophagoscopy
(*d*) X Rays
(*e*) Bougies

Diff diag (1) Nervous affections Cardiospasm
(2) New growths Carcinoma
(3) Extrinsic causes of dysphagia

Compl (*a*) Œsophagitis
(*b*) Peri œsophagitis
(*c*) Ulceration → perforation → cellulitis
(*d*) False passage in bouginage

Treat (1) **Bouginage**
Def Dilatation by bougies through œsophagoscope
Method (*a*) Intermittent
(*b*) Continuous Symond s or Souttar s tube
Tech (1) Antegrade Oral route
(2) Retrograde Gastrostomy route.
(2) **Gastrostomy**
(3) Reparative surgery Cardioplasty

(VIII) NERVOUS DISTURBANCES OF OESOPHAGUS

(1) GLOBUS HYSTERICUS

Etio Hysterical women

Clinic (1) Capricious dysphagia
(2) *Other hysterical stigmata*

Treat Psycho therapy

(2) CRICO-PHARYNGEUS SPASM

(See under Pharynx also)

Etio *Neurotic and anæmic middle aged women*

Path (1) Spasm of the crico pharyngeus part of inferior constrictor muscle.
(2) Atrophy of oral and pharyngeal muc. mem.

Clinic **Plummer Vinson Syndrome**
(1) Crico-pharyngeus dysphagia
(2) Oro pharyngeal muc. mem. atrophy
(3) Anæmia
(4) Splenic enlargement occasional

Compl: (a) Diverticula
(b) Carcinoma

Treat: (a) **Bouginage**
(b) Anti anæmic

(3) CARDIOSPASM (Achalasia cardia)

Def: Diffuse dilatation and hypertrophy of the œsophagus, associated with narrow cardiac opening due to achalasia cardia

Etio: Young adult females between 25–45

Theories (1) **Achalasia:**
Want of relaxation of the involuntary cardiac circular sphincter due to abnormality of the neuro muscular control, caused by want of balance between the sympathetic and the para sympathetic
(2) Congenital
(3) Primary œsophagectasia
(4) Phrenospasm
(5) Cardiospasm
(6) Secondary
Reflex to some irritative focus near by

Path (1) Cardiac narrowing
(2) Œsophageal hypertrophy and dilatation
(a) Fusiform
(b) Flask shaped
(c) S shaped
(3) Œsophagitis with ulceration

Clinic (1) **Intermittent dysphagia** with regurgitation
(2) Easy passage of stomach tube after a temporary halt at 17" from the teeth
(3) X Ray after barium meal
(4) Œsophagoscopy

Compl (a) Perforation and its sequelæ
(b) Regurgitation → respiratory aspiration

Treat (A) **Medical:**
(1) **Hurst's bougies:** (20 oz with mercury)
10 min before every meal for 5 10 min
First time through œsophagoscope
+ (2) **Anti-spasmodics:** Belladonna
Atropine
Eupavarine
+ (3) **Psychotherapy**
(B) **Surgical:**
(1) Mikulicz

(a) Gastrostomy
↓ (b) Cardiac dilatation by finger
(2) Laparotomy
↓ Dilatation of diaphragmatic opening
(3) Heller Section of muscle coat
(4) Cardio plasty
(5) Œsophago gastrostomy
(6) **Knight: Left gastric arterial sympathectomy**

(4) ŒSOPHAGEAL PARALYSIS (See under VI)

(IX) NEW GROWTHS OF THE OESOPHAGUS:

(A) INNOCENT
- (1) Cysts
- (2) Papillomata
- (3) Fibromata
- (4) Lipomata
- (5) Myomata

(B) MALIGNANT
- (1) Sarcoma

Etio More common after 40
Clinic Emaciation out of all proportions to dysphagia

(2) CARCINOMA ŒSOPHAGUS

Etio (a) Frequent
(b) **Males**: (except post cricoid)
(c) Age (α) 85% over **50**
(β) 40% over 60
(d) Sites **Anatomical constrictions:**
(a) 11" from teeth
\> (b) 17" from teeth
\> (c) 7" from teeth

Path. (1) Macroscopic (a) **Annular stricture**
(b) **Papillomatous**
(c) **Ulcerative**
(d) Diffuse
(e) Multi-centric

(2) Microscopic
(a) **Squamous**, upper two thirds
(b) Columnar lower one third
(c) Basal celled

(3) Spread (a) Direct peri œsophageal
(b) Lymphatic late
(α) Cervical glands
(β) Mediastinal glands
(γ) Cœliac glands
(c) Liver

Clinic (1) Retrosternal oppression } in a person past middle age
↓ (2) **Progressive dysphagia**
↓ (3) Regurgitation of food
↓ (4) Emaciation rapid

Signs (a) **Barium meal**
- (α) **Tortuous** channel
- (β) **No dilatation** of lumen

(b) **Œsophagoscopy**
- (α) No respiratory movements
- (β) Indurative infiltration

(c) **Bougies (contra indicated)**

Diff diag **Every cause of dysphagia**
- (1) Simple ulcers
- (2) Simple stenosis
- (3) Nervous abnormalities
- (4) Diverticulum
- (5) Extrinsic causes

Compl (a) **Broncho pneumonia** Intercurrent
(b) **Hæmatemesis** Rupture into vessels
(c) **Starvation cachexia**
(d) Perforation (α) Mediastinitis
(β) Respiratory lesions
(γ) Fistulæ
(e) Infiltration Recurrent laryngeal nerve
Phrenic nerve
Thoracic duct

Prognosis Average life 9–14 months

Treat (1) **Palliative Gastrostomy**
(2) **Deep X Rays**
(3) Radium tube or radon
(4) Intermittent bouginage
(5) Intubation
- (a) *Symond s gum elastic*
- (b) Souttar s metal

(6) Diathermy
(7) Œsophagectomy
(8) Local cocain + morphia injections

(X) DIVERTICULAE OF THE OESOPHAGUS

(See under Pharynx also)

Etio Men above 55

Path (a) Causes
- (α) Congenital
- (β) Acquired

Prolapse of the muc mem through a weak area in the musculature due to
- (a) Muscular degeneration
- (b) Sphincteric spasm

(b) Varieties (1) Pressure diverticula
(2) Traction diverticula
(3) Pressure traction diverticula

(c) Sites (1) Pharynx } (See under
(2) **Pharyngo œsophageal** } Pharynx)
(3) *Epibronchial* } *due to peri œsopha*
(4) Epiphrenic } geal inflammations.

Clinic (1) **Dysphagia**
(2) X Rays Dense, sharply-defined, rounded, regular bordered shadow with **over flow above the level of its lowest limit**
(3) Œsophagoscopy

Compl (1) Peridiverticulitis → adhesions
(2) Perforation (a) Mediastinitis
(b) Respiratory complications

Treat (A) Palliative bland diet + sac lavage
(B) Operative
(1) Invagination
(2) Diverticulopexy Hill
(3) Purse string obliteration Bevan
(4) Anastomosis to stomach
(5) Excision
(a) One-stage œsophagoscopic
(b) Two stage

(XI) OESOPHAGEAL VARICES.

Etio (a) Congenital
(b) Cirrhosis liver

Path Varicosity and tortuosity of œsophageal veins

Clinic Hæmatemesis

(XII) OPERATIONS ON THE OESOPHAGUS:

(I) SURGICAL EXPOSURE

Pre oper (1) Oral hygiene
(2) Preliminary gastrostomy
(3) Blood transfusions
(4) High caloric intake

Ind (1) Carcinoma
(2) Diverticulum
(3) Foreign bodies

Routes (A) Trans-pleural Lateral approach
(1) Right (a) Upper 2nd rib
Sternum
4th rib
(b) Lower 6th rib
cartilage to scapula
(2) Left Lower 6th rib
cartilage to scapula

(B) Mediastinal Posterior approach
(1) Right (a) Incision
2" right of midline
2nd rib to 8th rib
Vertical, curving out at lower border
↓ (b) Resection of 5th, 6th & 7th ribs
(2) Left (a) Incision
3 fingers breadth from midline
3rd rib to 11th rib
↓ (b) Resection of 4th to 11th ribs
(C) Abdominal Anterior approach
(1) Laparotomy
Median
Ensiform to umbilicus
(2) Merwedel
(a) Incision
(α) Median vertical
+ (β) Horizontal upto costal margin
↓ (b) Resection of 6th 7th, 8th & 9th costo chondral junctions

Indications of different exposures

(1) Upper œsophagus
Right trans pleural
(2) Middle œsophagus (lung root)
(a) Right mediastinal
(b) Right trans pleural
(3) Lower œsophagus
(a) Left trans pleural
(b) Left mediastinal
(4) Cardia
(a) Trans pleural left 9th intercostal
(b) Trans peritoneal
(c) Trans gastric

(2) ŒSOPHAGOSCOPY

Pre-oper X Ray exclude aortic aneurysm
Anæsth (a) General inhalation
(b) Evipan
(c) Local
Position Chevalier Jackson
(a) Flexion head cervical course
↓ (b) Extension head thoracic course
Difficulties (1) Crico-pharyngeal constriction
(2) Light anæsthesia
Compl Perforation with false passage
↓ (a) Hæmorrhage
(b) Sepsis

(b) Varieties (1) Pressure diverticula
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(3) Epibronchial
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(b) Sepsis

(XIII) IMPORTANT POINTS

(1) Important anatomical points of the œsophagus where it is constricted and, therefore, is a frequent seat of pathology are

(a) 7" *from teeth Commencement*
(b) 11" *from teeth Bronchial crossing*
(c) 17" *from teeth Cardiac orifice*

These points are frequent seats of
(1) Impacted foreign bodies
(2) Instrumental difficulties and trauma
(3) Strictures
(4) Carcinoma
(5) Diverticulæ

(2) Normal capacity of œsophagus is 150 c cs

(3) Another common site of impaction of foreign bodies especially in children is the episternal notch

(4) If a foreign body cannot be seen by an œsophagoscope and a bronchoscope look for it in
(a) Vallecula
(b) Pyriform fossa
(c) Œsophageal fold
(d) Stomach
(e) Naso pharynx

(5) Never accept old X Ray films for diagnosis of seat of impaction of foreign bodies before using œsophagoscope. Always take a recent film or screen just before œsophageal manœuvres

(6) Coin-catcher should always be used under screen and only for flattened objects in the pharynx or upper œsophagus.

(7) Most common causes of œsophageal dysphagia
(1) Trauma
(2) Stricture syphilis
(3) *Carcinoma*
(4) Cardiospasm

(8) Dysphagia

Cause	*Nature of dysphagia*
(a) Cardiospasm	Intermittent
(b) Stricture	Continuous + progressive → stationary
(c) Carcinoma	Continuous + progressive → → →

(9) In any kind of dysphagia cachexia is early and marked due to starvation and so is not a point in differential diagnosis between innocent and malignant states.

(10) *Steadily progressive dysphagia in older people*
? Carcinoma œsophagus

(11) Impaction of a foreign body is the most frequent cause of acute dysphagia

(12) All treatment of œsophageal stenosis should be based on the endoscopic examination of the stricture

(13) *Blind bouginage should never be undertaken under general anæsthesia*

(14) *More than 80% of carcinomata arise either at or below the tracheal bifurcation*

(15) *85% of carcinoma œsophagus are over 50 and almost 40% are over 60*

(16) Any patient who develops a disturbance of the act of deglutition should be immediately referred to a competent radiologist for X Ray Œsophagoscopy is advised even if X Ray is negative

(17) Œsophagoscopy is indicated in every case of minor difficulties in swallowing or in cases of persistent lower substernal discomfort after deglutition

(18) The fatality of œsophageal carcinoma lies in
- (a) Rapid infiltration of vital structures
- (b) Late appearance of symptoms
- (c) Technical difficulties of excision

(19) *Out of every 10 cases of œsophageal carcinoma, 9 will die of broncho pneumonia and 1 from hæmatemesis*

(20) *Œsophageal varices in cirrhosis of the liver, are the most common cause of profuse hæmatemesis*

(21) Indications for gastrostomy
- (1) Active stage of ulceration
- (2) Stenosis
- (3) Carcinoma
- (4) Preoperative
- (5) Palliative

(22) *Gastrostomy is a life saving measure in œsophageal obstruction*

(23) Gastrostomy is always a wise accompaniment of any plastic operation on œsophagus

(24) *Exclude aortic aneurysm before œsophageal instrumentation in every case*

(25) X Ray appearances
- (1) Diverticula
  - (a) Barium out flow is higher than the lowest level
  - (b) Regular flow
- (2) Stricture
  - (a) Barium out flow at the lowest level

(3) Carcinoma:
 (a) Barium out flow at the lowest level
 (b) Irregular and tortuous flow

(4) Cardio spasm
 Spindle shaped œsophagus

(5) Mega-œsophagus:
 : Tortuous œsophagus.

(26) *Sympathetico parasympathetic neuro muscular disturbances:*

 (a) *Crico pharyngeus achalasia*
 (b) *Cardiospasm*
 (c) *Congenital pyloric stenosis*
 (d) *Megacolon*
 (e) *Congenital hydro nephrosis and hydro ureter.*

CHAPTER IV

GASTRO—DUODENAL SURGERY

(A) THE STOMACH

(I) CONGENITAL ABNORMALITIES:

(1) ATRESIA OF THE PYLORUS

Clinic (a) Vomiting from birth
(b) Acute gastric dilatation
(c) Retraction of the rest of the abdomen

(2) HYPERTROPHIC PYLORIC STENOSIS

Def Pyloric obstruction due to
(a) Spastic hypertrophy of pyloric sphincter
+ (b) Œdema of the pyloric mucosa

Theories

(A) **Sphincter theory:**

(1) Thomson **Primary spasm** due to
(a) Nervous inco ordination
or (b) Hyper acidity
or (c) Hyperæsthesia
or (d) Hyper adrenalism

(2) **Achalasia:**
(a) Inco ordination of neuromuscular control
↓ (b) Achalasia of pyloric sphincter
↓ (c) Sphincteric hypertrophy
↓ (d) Pyloric obstruction

(B) **Pyloric muscle theory:**

(3) Hirschsprung
: **Primary pyloric hyperplasia**

(4) **Neuromuscular pyloric hyperplasia:**
(a) Sympathetic or filling mechanism
> (b) Parasympathetic or emptying mech
↓ (c) Hypertrophy of
(α) Circular muscle of the pylorus
(β) Longitudinal muscle of the pylorus
+ (d) **Circular pyloric sphincter is normal**

Etio First born male infant

Clinic (1) **Latency:** 3 weeks (1st week to 6th week)
(2) Projectile, regurgitant **vomits** with no bile
(3) **Dilated stomach** with visible peristalsis
(4) Acorn like **pyloric tumour**
(5) Constipation
(6) Dehydration and starvation **cachexia**

Sign X Rays gastro stasis

Diff diag (1) Pylorospasm
Response to
(a) Luminal $\frac{1}{8}$th–$\frac{1}{6}$th gr
(b) Atropine 5 min of 1–1000 sol
(2) Gastritis
(3) Congenital pyloric atresia
Birth vomiting with no bile
(4) Congenital duodenal atresia
Birth vomiting with bile

Compl (1) Tetany alkalosis
(2) Jaundice
(3) Cachexia

Treat (A) **Medical:**
(1) 4 hourly feeds Breast milk + 10% glucose
(2) Re feeding after each vomit
(3) Antispasmodics before each feed
(a) *Eumydrine*
(b) Luminal 1/8th 1/6th gr
(c) Atropine 1 in 1000 5 min.
(4) Gastric lavage B D
By normal saline
Do not use soda-bi-carb solution
(5) Parenteral hydrotherapy

(a) Normal saline (b) 5 10% dextrose (c) Hartmann s sol	subcutaneous intravenous intraperitoneal

(6) Blood transfusion 10 c.cs per pound weight

(B) **Surgical Fredet Ramstedt**

Tech (See under operations)

Post compl (1) **Shock and collapse**
(2) Inanition cachexia
(3) Hæmorrhage intraperitoneal
(4) Peritonitis duodenal rupture
(5) **Enteritis**
(6) Hyperpyrexia
(7) **Continued vomiting:**
(a) Incomplete division of sphincter
(b) Intolerance of milk
(c) Gastric spasmophilia
(d) Peritonitis
(8) Wound complications
(a) Burst abdomen
(b) Suppuration
(c) Ventral hernia
(9) **Chest complications:**
Broncho pneumonia

(II) TRAUMA:

(1) RUPTURE STOMACH

Etio (a) External blows, run overs
(b) Internal distension
instrumentation
foreign bodies

Clinic Perforative peritonitis local or general
Treat Exploratory laparatomy

(2) WOUNDS OF THE STOMACH

Etio Stabs, gun shot wounds
Clinic (a) Epigastric wound + shock
↓ (b) Perforative peritonitis
Signs **Depend on the contents of the stomach at the time of injury**
Treat **Exploration** → Suture → Peritoneal toilet
Ind **Every stab wound over the abdomen**

(3) FOREIGN BODIES IN THE STOMACH

Etio Children, lunatics, jugglers, hysterics
Objects Toys, coins, pins, hairballs
Clinic (1) History or no history
(2) Gastritis or gastric obstruction
(3) X Rays
Compl (a) Obstruction
(b) Ulceration → perforation → peritonitis
Treat (A) **Obstructive or perforative objects**
Immediate removal through **gastrotomy**
(B) **Passable non-dangerous objects:**
: **Conservative and observative**·
(1) Normacol, bulky food
(2) **No purgatives; give lubricants**
(3) Constant observation
(a) Signs of obstruction
(b) Every stool
(c) Repeated X Rays
(C) **Potentially dangerous objects:**
(1) **Constant observation**
↓ (2) **Operative** interference if
(a) Appearance of urgent signs
(b) Stasis at one spot (X Rays)

(4) BURNS OF THE STOMACH

Etio (a) Accidental
(b) Suicidal
(c) Homicidal
Cause Caustics sulphuric or nitric acids
... alies

Clinic (1) History
(2) Acute gastritis + shock
(3) Foul smelling coffee ground vomits

Diff diag (a) Acute gastritis
(b) Gastric ulcer with hæmorrhage

Compl (1) Perforation → peritonitis
(2) Cicatrisation (a) Cardiac
(b) Pyloric
(c) Hour glass
(3) Lung complications

Treat (1) **Chemical antidotes and emollients**
(2) Rectal feeding
(3) Hydrotherapy rectal, cutaneous, venous
(4) **Jejunostomy:** For feeding
Ind Gastritis persisting after a week

(III) PEPTIC ULCER:

Def **Ulceration due to digestive action of acid gastric juice** on a devitalised mucous membrane exposed to its action

Varieties (1) Œsophageal rare
(2) **Gastric:** Occasional
(3) **Duodenal:** Most common
(4) **Gastro jejunal** or anastomotic } post operative
(5) Jejunal } post operative
(6) Meckel s diverticular rare

(A) ACUTE PEPTIC ULCER

Path **Acute erosion due to auto-digestion** of the gastric mucous membrane, the resistance of which has been lowered by
(a) Acute or chronic infective toxæmia
or (b) Avitaminosis of vit. A
Small, punched out, superficial and multiple
With associated gastritis

Pre lesions (1) Arterial embolism or thrombosis
(2) Toxic necrosis
(3) Lymphoid folliculitis

Association with
(a) Acute gastritis
(b) Chronic gastric ulcer
(c) Gastric carcinoma

Clinic (1) **Acute hæmatemesis** or melæna
or (2) Sudden perforation
or (3) **Acute gastritis syndrome**

Treat Rest + Dietetic + Medical (See under chronic)

(B) SUBACUTE PEPTIC ULCER:

Path: (1) Persistence and extension of acute ulce
(2) Exacerbation on a chronic ulcer

Clinic (a) Persistence of subsiding acute ulcer sig...
or (b) Exacerbation on chronic ulcer signs

(C) CHRONIC PEPTIC ULCER

Etio (1) Age (a) Gastric ulcer young (15–25)
(b) Duodenal ulcer middle (30–50)

(2) Sex (a) Gastric ulcer females > males
(b) Duodenal ulcer males > females

(3) Family history of hyperchlorhydria
ulcer
carcinoma

(4) **Diet:** (a) Spices and hot food
(b) **Tobacco,** betel nut
(c) Avitaminosis A, D and C

(5) **Gastritis**; Chronic hypertrophic

(6) **Anxiety and mental stress**

Path **An acute peptic ulcer made chronic by:**

(1) **Ulcer diathesis**·

(a) **General.**
(α) Asthenic gastric ulcer
(β) Sthenic duodenal ulcer

(b) **Local or gastric:**
(α) Altered gastric motility
(1) Pyloric spasm + gastro stasis
. Gastric ulcer
(2) Hyper motility + rapid flow
Duodenal ulcer
(β) Hyper acidity
(1) Congenital hyper secretion
(2) Absence of bile regurgitation

(2) **Distant chronic septic focus:**
(a) Pyorrhea alveolaris
(b) Chronic appendicitis

Causation theories

(1) Ulcer diathesis
(2) **Neurogenic:** Tobacco
Mental strain
(3) **Acid and gastric motility factor**
(4) Chronic gastritis
(5) Vascular septic thrombosis or embolism

Sites:

(1) Stomach: (*a*) **Pylorus**: (α) **Anterior wall**
(β) **Lesser curvature**
(γ) Posterior wall
(*b*) Body
(*c*) Cardia

(2) **Duodenum: Within 1·5" from pyloric sphinct:**
(*a*) **Anterior wall**
(*b*) Posterior wall

Theories of situation:

(*a*) **Ischæmia**: Endarteritis
(*b*) **Traumatism**: Magenstrasse
(*c*) **Lymphoid folliculitis**

Morb anat

(1) **Complete breach of muscle coat in the floor**
(2) Fibrotic induration and puckering
(3) Adhesions and lymphadenitis
(4) Penetration into other organs
(5) Association of gastric and duodenal ulcers

Clinic (A) **Local examination:**

(1) **Pain:**
(*a*) *Epigastric or referred*
(*b*) **Latent Period:**
Varying directly with the distance from the cardia
(α) Cardiac 5–10 min after food
(β) Body 10–30 min " "
(γ) Pylorus ½ to 2 hrs " "
(δ) Duodenal 2½ to 5 hrs " "
(*c*) Influenced by
(α) Food
(1) Worsens gastric pain
(2) Relieves duodenal pain
(β) Alkalies relief of pain

(2) **Vomiting**: Marked in gastric ulcer
due to (*a*) Gastritis
(*b*) Pyloric obstruction
nature (1) Hæmatemesis
In gastric ulcer
(2) Water brash:
In duodenal ulcer

(3) **Appetite:**
(*a*) Good but afraid to eat, gastric
(*b*) Good and relief by food: duodenal

(4) **Local tenderness :** Transpyloric
(*a*) Left of midline gastric
(*b*) Right of midline duodenal

(B) **General examination :**

(1) **Ulcer diathesis**
(*a*) Asthenic gastric
(*b*) Sthenic duodenal

(2) Weight
(*a*) Loss in gastric
(*b*) Gain in duodenal

(3) **Distant septic focus :** Teeth appendix

(C) **Special examination :**

(1) **Test meal :**
(*a*) Total nearer the ulcer to the pylorus and beyond, higher the total acidity
(*b*) Fractional absence of gradual fall in the acidity curve

(2) **Barium meal :**
(*a*) Direct niche, notch, crater, deformity
(*b*) Indirect
(α) Gastric shape and tonus
(β) Hyper or hypo motility
(γ) Stasis or rapid emptying
(i) Gastric ulcer
(*a*) Hypotonic
(*b*) Hypomotile
(*c*) Static
(ii) Duodenal ulcer
(*a*) Hypertonic
(*b*) Hypermotile
(*c*) Rapid emptying

(3) **Occult blood ·**
(*a*) Gastric contents or vomit
(*b*) Stools

(D) Excluding examination exclude
(1) Simple gastritis or hyperchlorhydria
(2) Reflex dyspepsia
(*a*) Pyorrhea alveolaris
(*b*) Chronic appendicitis
(*c*) Chronic colitis
(*d*) Chronic cholecystitis
(*e*) Chronic pancreatitis
(*f*) Chronic hepatitis
(3) Heart conditions angina
(4) Spine T B
(5) Specific diseases syphilis

(6) Metabolic diseases · uræmia
(7) Blood diseases pernicious anæmia
(8) Nervous diseases tabes dorsalis

Diagnosis *Special diagnostic feature*

: **Seasonal periodicity :**

Etio (*a*) Nervous or mental strain
(*b*) Indiscretion in diet

Path Intermittent exacerbation ·
of ulcer or concomitant gastritis

Clinic (1) Marked in duodenal ulcer
(2) Absent in complications
(*a*) Chronic perforation
(*b*) Adhesion
(*c*) Stenosis
(*d*) Carcinoma

Diff diag (A) **Local gastro duodenal conditions :**

(*a*) Organic
(1) Gastritis and duodenitis
? pyorrhea alveolaris
(2) Syphilis and T B stomach
(3) Carcinoma stomach
(4) Duodenal diverticulæ, ileus, bands
(5) Gastro ptosis

(*b*) Functional
(1) Pylorospasm
(2) Nervous
(3) Tabetic
(4) Migraine

(B) **Reflex surgical dyspepsias ·**

(*a*) *No relation with food*
(*b*) *No intermissions*
(*c*) *Associated other signs*

(1) Appendicitis tender Mc Burney
(2) Cholecystitis five fs.
(3) Pancreatitis stool examination
(4) Carcinoma colon barium enema
(5) Ilio-cæcal T B rt iliac tumour
(6) Visceroptosis X Rays
(7) Epigastric hernia pain on posture

(C) **Neighbouring conditions : Referred**

(1) Œsophagus
(2) Heart
(3) Diaphragm hernia
(4) Spine

(D) **General conditions : Medical**

(1) Blood diseases pernicious anæmia
(2) Metabolic diseases uræmia

(3) Specific diseases. syphilis
(4) Nervous diseases tabes

omplications (1) **Perforation:**
(A) **Intra peritoneal:**
(*a*) **Acute:** General peritonitis
(*b*) **Subacute:** Perigastric abscess
(*c*) **Chronic:**
(α) Internal fistulæ
(β) Penetration into neighbours
(B) **Extra peritoneal:**
Retro peritoneal cellulitis
In posterior duodenal ulcers
(2) **Hæmatemesis.**
(A) Acute
(B) Chronic and recurrent
(3) **Stenosis:**
(A) Cardiac dysphagia
(B) Body hourglass
(C) Pyloric gastric obstruction
(4) **Perigastritis with adhesions·**
Loss of periodicity
Change in the character of symptoms
(5) **Carcinoma:**
In gastric ulcer
Change in the character of symptoms
(6) **Jaundice:**
In duodenal ulcer

Treatment (A) **Medical and dietetic treatment·**
Ind (*a*) **Uncomplicated cases**
During first two years
(*b*) **Fear of anastomotic ulcer.**
(α) Short history
+ (β) Hyper chlorhydria marked
+ (γ) Gastric hypermotility
+ (δ) Sthenic diathesis

Tech (1) Rest in bed with **mental rest·**
In acute and subacute phase
(2) **Removal of septic foci**
(3) **Antacids and neutralisers·**
(*a*) Alternate powders of
(α) Neutralon belladonna
one teaspoon
& (β) Four carbonates
Mag carb
Bism carb
Calc. carb
Soda bi-carb
} $\overline{aa}$ grs. xx

(b) Magsorbent
(c) *Aludrox*
Colloid aluminium hydroxide
(d) Plenty of butter and olive oil

Complications of antacids and alkalies:

(1) Rebound acidity
Mag oxide and carbonate
Soda bi-carb
(2) Diarrhea
Mag oxide and carbonate
(3) Constipation
Calcium carbonate
(4) Alkalosis
Etio Soda bi-carb
Clinic (1) Obstinate constipation
(2) Anorexia -> nausea -> vomiting
Headach -> irritability
Flushing -> perspiration
Aching -> weakness of muscles
Tetany -> convulsions -> coma
Signs (1) Urine alkaline
(2) Blood increase in alkali reserve
Treat (1) Stop alkalies
(2) ℞ Ammon. chlor grs. xx T.D.S.
or ℞ Acid sod phosph. grs. xxx T D S

(4) Diet: Sippy

Points (A) *Milk* neutralises approximately its own value of gastric juice
(B) **Fats** diminish the amount of gastric secretion
Tech (1) Small feeds every alternate hour
(a) Milk ounces v
+ (b) Soda citras grs. x
(2) Big feeds T D S
(a) Milk ounces xxxv
+ (b) Cream ounces v
+ (c) Soda citras grs. *120*
(3) Allow
Arrow-root
Barley, *butter* Bemax
Custard cream codliver oil
F[illegible]
Marmite
Olive oil orange juice
(4) Avoid:
: Alcohol, spices, tobacco

(5) Injections of.
. **Histidine or Larostidine**
. Daily intramuscular injection of 5 c c. of 4% sol for three weeks

(B) **Surgical treatment:**

Ind. (1) **Failure of medical treatment for two years**
(2) Frequent relapses. more than six
(3) Disappearance of periodicity
(4) Change in the character of symptoms
(5) **Appearance of complications:**
(*a*) Perforation
(*b*) Hæmatemesis recurrent
(*c*) Stenosis. pyloric or hour glass
(*d*) Perigastric adhesions
(*e*) Suspicion of malignancy
(*f*) Large ulcer as shown by X Rays

Tech (I) **Gastric ulcer:**
(1) Pyloric exclusion + (4)
or (2) Balfour's cautery + (4)
or (3) Walton's wedge resection + (4)
(4) **Gastro-jejunostomy**
(5) Sleeve resection
(6) **Partial gastrectomy**
(7) Jejunostomy
For high large ulcers
(8) Cholecyst gastrostomy

(II) **Duodenal ulcer:**
(1) **Gastro-jejunostomy**
(2) Pyloric exclusion + (1)
Finsterer's R z A
(3) **Partial duodeno gastrectomy**
(4) Gastro duodenostomy

Choice of operations in chronic gastro duodenal ulcers.

(A) Chronic gastric ulcer
(1) Body of the stomach
(*a*) Small lesser curve ulcers
(α) Normal acid curve
Local excision + gastro jejunostomy
(β) High acid curve
Partial gastrectomy
(*b*) Letter box ulcer near cardia.
(α) Gastro jejunostomy
(β) Jejunostomy

(c) Large ulcer of the body
(α) Partial gastrectomy Operation of choice
(β) Jejunostomy
(2) Pyloric ulcers
(a) Gastro-duodenal resection
(b) Gastro-jejunostomy
(B) Chronic duodenal ulcer
(1) Duodenal ulcer with stenosis
Gastro-jejunostomy Operation of choice
(2) Duodenal ulcer without stenosis
(a) Pyloroplasty small lesions
(α) Horsley small anterior ulcer
(β) Judd small ulcer + mobile pylorus
(b) Gastro-duodenostomy high acidity
(α) Finney
(β) Jabouley
(c) Gastro jejunostomy
+ (α) Infolding
(β) Excision
(γ) Cauterisation
(d) Partial gastrectomy Operation of choice

Common suitable operations for gastro duodenal ulcers

(1) Chronic gastric ulcer partial gastrectomy
(2) Chronic duodenal ulcer
(a) Without stenosis partial gastrectomy
(b) With stenosis gastro jejunostomy

(C) Complications of gastro-duodenal ulcers
(1) Perforation
(a) *Simple closure* (α) *Without drainage*
(β) With drainage
(b) Closure + gastro-jejunostomy
(c) Partial gastrectomy ?
(2) Haemorrhage
(a) Blood transfusion + diet
↓ (b) Infolding + pyloric exclusion + gastro-jejunostomy
or (c) Partial gastrectomy
(3) Hour-glass stomach
Partial gastrectomy
(4) Pyloric stenosis
(a) *Gastro jejunostomy*
or (b) *Partial gastrectomy*
(5) Malignant degeneration
Extensive resection with lymphatic area
(6) Gastro-colic fistula
Wilkie a two-stage operation
(a) Exclusion of involved colon
↓ (b) Excision of fistula with partial gastrectomy

Complications of gastro-duodenal peptic ulcers:

(I) GASTRO-DUODENAL PERFORATION:

Etio: Frequency: 10–15% of ulcers
Age and sex: Middle aged males
Previous history: In 80%
Site: 90% duodenal
: 90% anterior
: Intraperitoneal

Clinical varieties.

(A) **Acute perforation:**

Def: Extravasation of contents has **access to general peritoneal cavity**

Clinic: (1) **Stage of premonition:** ***(Present or absent)***
: Exacerbation of symptoms of ulcer

↓ (2) **Stage of prostration:** *Abdominal collapse*
- (*a*) Collapse with a vomit
- (*b*) Intense epigastric pain
- (*c*) Board-like rigidity
- (*d*) Widespread tenderness

↓ (3) **Stage of reaction:** *Period of illusion*
- (*a*) No shock
- (*b*) No pain
- (*c*) Board like rigidity

↓ (4) **Stage of peritonitis:** *Acute abdomen*

↓ (5) **Stage of toxæmia:** *Paralytic ileus*

Special signs. (1) **Board-like tender rigidity**

Epigastrium
R.I F. triangle of tenderness
P R.

(2) *Slow pulse for eight hours*

(3) **Disappearance of liver dullness**

(4) Pneumo peritoneum. X Ray

(5) Silent abdomen

Differential diagnosis of acute gastro duodenal perforations:

(1) **Medical conditions:**
- (*a*) Digestive: gastritis, enteritis, colics
- (*b*) Respiratory: inflammations
- (*c*) Circulatory: (α) Angina
  (β) Embolism
- (*d*) Urinary: colics
- (*e*) Nervous: crises

(2) **Surgical conditions:**
(A) **Extra abdominal:** Referred
(*a*) Spine
(*b*) Acute testis
(*c*) Kidney
(B) **Abdominal wall:**
Muscle inflammations
(C) **Intra abdominal:**
(*a*) Acute exacerbation of ulcer
(*b*) *Acute appendicitis*
(*c*) Acute cholecystitis
(*d*) *Acute pancreatitis*
(*e*) *Acute peritonitis*
(*f*) Acute intestinal obstruction
(*g*) Acute hæmoperitoneum

Treatment (1) **Immediate laparotomy:** *Within six hours*
↓ (2) **Exploration**
↓ (3) **Treatment of the perforation:**
(*a*) **Simple suture + omental graft:**
Ind Operation of choice
(*b*) **Suture + gastro jejunostomy:**
Ind (1) Patient in good condition
(2) Good surgeon
(3) Good anæsthesia
(4) Recent perforation
(5) Closure → obstruction
(*c*) Suture + pyloroplasty
Ind Suture → obstruction
(*d*) Wedge resection
(*e*) Partial gastro duodenal resection
Ind As in (*b*)
(*f*) Temporary gastro or duodeno stomy
Syn Braun's operation
Ind Suture not possible due to induration
↓ (4) **Peritoneal toilet:** (*a*) **Dry**
(*b*) **Wet**
↓ (5) **Closure:** (*a*) *Without drainage if early*
(*b*) **With drainage**

Post-compl (1) **Within 48 hours:**
(*a*) *Shock*
(*b*) *Acute gastric dilatation*
(2) **Within one week:**
(*a*) Parotitis
(*b*) *Chest complications*
(*c*) *Peritonitis*

(3) **Within three weeks:**
(*a*) *Wound sepsis*
(*b*) *Residual abscess* sub phrenic
pelvic
(*c*) Pylephlebitis
(4) **Sequelæ:**
(*a*) Recurrence of symptoms
(α) Original ulcer
(β) Ulcer complications
(γ) Anastomotic ulcer
(*b*) Adhesive obstruction
(*c*) Ventral hernia

Causes of death (1) Time factor
(2) Age factor
(3) **Pathology factor:**
(*a*) **Contents of the stomach:**
At the time of perforation
(*b*) **Size of the perforation**
(*c*) **Extent of extravasation:**
In peritoneal cavity

(B) ***Sub-acute perforation:***

Def Extravasation of contents has **access to** limited **(perigastric) region** of the peritoneal cavity

Causes (1) Gastric ulcer
(*a*) **Empty stomach**
(*b*) **Small size of the perforation**
(*c*) Posterior perforation
(*d*) Regional adhesions
(2) Duodenal ulcer
(*a*) Regional adhesions
(*b*) Extraperitoneal perforation

Clinic (1) Subacute or acute **perforation** syndrome
↓ (2) **Subphrenic abscess** syndrome
(*a*) **Active:** (α) Acute upper peritonitis
(β) Septic toxæmia
(*b*) **Passive:** (α) No local signs
(β) Septic toxæmia
(1) Active fever
(2) Passive
subnormal temp
wasting
(*c*) **X-Ray:** Elevated and fixed diaphragm

Diff diag From other causes of
(1) **Subphrenic abscess.**
(*a*) Duodenum
(*b*) Gall bladder

(c) Liver
(d) Pancreas
(e) Appendix
(f) Colon
(2) **Perinephric abscess**
(3) **Liver infections:**
Liver abscess
(4) **Chest inflammations:**
Pleurisy, pneumonia

Compl (a) Chest inflammations
(b) Gastric or duodenal fistula

Treat (1) **Expectant:**
Ind (a) Early subsiding cases
(b) Progressive localisation
(c) Poor risks
(2) Operative
Ind (a) Acute signs with persistence
(b) Failure of conservatism
(c) Localised abscess
Tech **Open exploration → drainage**
Post. treat (a) Position of efficient drainage
(b) Daily dressings
(c) Sulphonamide etc.
Post. compl (1) Peritonitis
(2) Gastric or duodenal fistula
(3) Chest inflammations

(C) Chronic perforation:

Def Erosion or perforation into an adherent solid or hollow organ

Clinic (1) **Change in the character of symptoms:**
(a) Absence of periodicity
(b) Constancy of pain
(c) Radiation of pain
(2) **Signs of internal fistulæ**

(1) Intraperitoneal perforations
Etio (1) Gastric perforations
(2) Anterior duodenal perforations
Clinic Peritonitis or intraperitoneal abscess
Gastro-colic fistula
(2) Extraperitoneal perforations
Etio Posterior duodenal perforations
Clinic (a) Retro-peritonitis
↓ (b) Duodenal fistula

(2) HÆMATEMESIS

Causes (1) **Cirrhosis liver:** Most common
(2) **Gastric lesions:**
(a) Acute gastric ulcer

(*b*) **Chronic gastric ulcer:**

(α) Hæmatemesis from a chronic gastric ulcer tends to recur especially after 40

(β) Simple gastro-enterostomy alone cannot stop massive gastric hæmorrhage. Direct attack on bleeding point is necessary

(*c*) **Gastric carcinoma**

(*d*) Gastrostaxis chlorotic young females

(*e*) Reflex gastritis appendicitis
acute sepsis

(*f*) **Post operative:** After gastric operations

(3) Blood diseases

(4) Acute sepsis acute gastric erosions due to septicæmic embolism

(5) **Collective hæmatemesis:**

Gastric collection of blood from

(*a*) Fracture skull base
(*b*) Operations on oropharynx
(*c*) Rupture of an aneurysm

Clinic (A) **Acute hæmatemesis:**

(*a*) Copious vomits of bright red blood
(*b*) General signs of hæmorrhage
(*c*) Blood examination
(α) R B Cs < 3000000
(β) Hæmoglobin < 60%

(B) **Chronic and recurrent hæmatemesis:**

(*a*) Small, recurrent, coffee ground vomits
(*b*) Secondary anæmia

Signs (1) **Severe hæmatemesis:**

(*a*) Grave general condition
(*b*) R B Cs < 2000000
(*c*) Hæmoglobin < 40%

(2) **Moderate hæmatemesis:**

(*a*) Border line general condition
(*b*) R.B Cs < 3000000
(*c*) Hæmoglobin < 60%

(3) **Trivial hæmatemesis:**

(*a*) Good general condition
(*b*) Slight anæmia
(*c*) Occasional blood streaks in vomits

(4) **Laboratory hæmatemesis:**

Occult blood in vomit or gastric contents

Diff. diag: (A) Swallowed bleeding from:
(1) Fracture skull
(2) Oro pharynx
(3) Respiratory passages
(B) Œsophageal varices
(C) Gastric lesions
(D) Duodenal lesions
(E) Ruptured aneurysm

Treat. (A) **Acute hæmatemesis:**
(a) *Immediate to 48 hours:*
: **Conservative treatment of bleeding**
(b) *Within 48 hours if condition becomes worse inspite of blood drip transfusion*
or (c) *48 hours to one week after cessation of acute hæmatemesis.*
: **Operative treatment of bleeding**
(B) **Moderate or recurrent massive hæmatemesis:**
(a) **Conservative treatment of bleeding**
↓ (b) **Operative treatment of:**
(α) **Bleeding**
+ (β) **Ulcer**
(C) **Chronic or recurrent small hæmatemesis:**
: **Operative treatment of ulcer**

(1) *Conservative treatment of hæmatemesis*
(A) **Absolute rest:** Physical
Physiological
: Psychological
(B) **Antishock:** Morphia
Low Fowler position (Bailey)
(C) **Drip blood transfusion:**
Ind: (a) Pulse rate > 120
(b) Blood pressure < 90 Hg
(c) Hæmoglobin < 40%
(D) **Blood coagulants:**
: Calcium chloride or gluconate
: Serum
: Hæmoplastin
: Coagulen-ciba
: Kapilin
(E) **Rectal and subcutaneous hydrotherapy**
(F) ***Local treatment:***
(a) External: ice bag over epigastrium
(b) Internal:
(α) Ice to suck

(β) Drugs:
(1) Adrenalin chloride 1 in 1000:
: One drachm every hour
(2) Tribasic mag. phosph
: In water
(3) Four carbonates powder
Teaspoonful t d.s
(4) Ferri et ammon. citras.
: Grs 30 t.d s.

(G) Diet
(a) Meulengracht · (Med. Ann. 1937)
6 a.m. Tea, white bread, butter
9 a.m Oatmeal, milk, white bread, butter
1 p.m : Omelette, fish, vegetables, potato, rice,
3 p m Cocoa
6 p.m.: White bread, butter, meat, cheese, tea
+ Alkaline powders
(b) Anderson ·
: Lenzhartz diet + gelatin sol

(2) *Operative treatment of hæmatemesis :*

Ind: Hæmatemesis of chronic gastric ulcer
(a) **Early view:** Within 48 hours
If: (α) Drip blood transfusion
+ (β) Hæmoglobin 90%
(b) **Late view:** After 48 hours to one week

Preoper · (1) Antishock
(2) **Drip blood transfusion**

Anæsth. Local novocain infiltration

Tech: (1) Exploratory laparotomy
↓ (2) Treatment of focus
(A) Condition poor
(a) Ligatures under running gastro-duodenal art
(b) Intra-gastric or intra-duodenal cautery
(B) Condition bad
(a) Gastro jejunostomy
+ (1) *Ligature*
or Cautery
or Infolding
+ (2) Pyloric occlusion
(b) Gastro-duodenostomy.
+ (1) *Ligature*
or Cautery
or Infolding
(C) Condition good ·
(1) Duodenal hæmorrhage.

(a) Gastro-duodenal resection:
+ Duodenal occlusion
(b) Finsterer's partial gastrectomy:
+ Pyloric occlusion
(2) Gastric hæmorrhage:
(a) Partial gastrectomy
(b) Wedge resection
+ Gastro-jejunostomy

(3) PYLORIC OR DUODENAL STENOSIS:
: **With chronic gastric dilatation**

Etio (A) **Organic stenosis:**
: Fibrosis, infiltration, pressure
(a) **Gastric causes:**
(1) Chronic gastric or duodenal **ulcer**
(2) Gastric **carcinoma**
(3) Post burn fibrosis
(4) Infantile hypertrophic stenosis
(b) **Extra gastric causes:**
(1) Perigastric **adhesions**
(2) Extra gastric malignancy:
(α) Gall bladder
(β) Pancreas
(γ) Colon
(B) **Functional stenosis: visceroptosis**
(1) Gastroptosis
(2) Superior mesenteric ileus
(3) Mobile kidney
(C) **Reflex spasmodic stenosis:**
(1) Chronic peptic ulcer. no fibrosis
(2) Appendicitis

Clinic: **Mechanical obstruction + gastritis:**
(1) **Change in the character of ulcer symptoms:**
(a) Loss of periodicity
(b) Constancy of pain
(2) Epigastric discomfort and tympanitis
(3) Copious foul smelling **vomits or eructations**
(4) Starvation + dehydration
(5) **Dilatation stomach** with visible peristalsis
(6) Pyloric tumour. in carcinoma

Signs (a) **X-Rays: Barium meal**
(1) Hyper peristalsis with stasis
(2) Large size of the stomach
(3) Filling defect pyloric or duodenal
(b) **Test-meal: Hypochlorhydria**
(1) Less acidity total and free
(2) Occult blood. in ulcer or cancer

(c) **Stomach contents or vomit:**
(1) Recovery of food taken long back
(2) Occult blood in ulcer or cancer
(d) **Stools:** Occult blood
(e) **Blood:** Alkalosis

Diff. diag Between
(1) Organic and functional or reflex causes
(2) Simple and malignant causes
(3) Gastro duodenal and extra gastroduodenal
(A) Simple organic stenosis
(1) Long intermittent history
(2) Ulcer symptoms
(B) Malignant stenosis
(1) Short continuous history
(2) Anorexia
(3) Tumour
(4) X Rays
(C) Reflex stenosis
Reaction to antispasmodics

Compl (1) Dehydration
(2) Chlorine deprivation
(3) Uræmia
(4) Tetany
Clinic (a) Dyspnœa + cyanosis
(b) Spasms of extremities
Treat (a) Continuous gastric aspiration
(b) Glucose saline
(c) Parathyroid extract
+(d) Ca chloride ½ gr intravenous

Treat (A) **Conservative:**
Ind Functional and reflex spasmodic
Tech (1) Antispasmodics
Atropine, belladonna
Octinum, Eupaco
(2) Gastric lavage
(3) **Removal of irritative focus:**
Appendicectomy
(B) **Operative:**
Ind **Organic stenosis**
Preoper (1) Stomach wash B D for some days
(No soda bi-carb. sol)
(2) Hydrochloric acid in small doses
(Avoid alkalies)
(3) Hydrotherapy glucose saline
By (a) Mouth
(b) Rectum
(c) Subcutaneous
(d) Intravenous
Upto day

(4) Blood transfusion
(5) Starving and lavage
(6) Pass and keep in Ryle's tube
(7) Preliminary jejunostomy:
: In carcinoma or extensive ulcer

Anæsth. (a) Local + splanchnic
(b) Spinal
(c) Cyclopropane (general)

Tech: (A) **Simple Causes:**
(1) Posterior **gastro-jejunostomy**
(2) Gastro-duodenostomy
(B) **Malignancy:**
(1) **Partial gastrectomy:**
: *If operable*
(2) Gastro jejunostomy + **Devine**
: If inoperable
(C) **Perigastric lesion:**
: **Gastro-jejunostomy**

(4) HOUR-GLASS STOMACH:

Causes (1) Congenital
(2) **Acquired:**
(A) **Intrinsic:**
(1) Chronic gastric saddle shape ulcer
(2) Carcinoma body
(3) *Gastrojejunal ulcer*
(4) Corrosive burns
(B) **Extrinsic:**
(1) Perigastric adhesions
(2) Perigastric malignancy
(3) Perigastric pressure
(C) Reflex spasmodic

Etio: Females between 50 and 70

Path: (1) Organic hour glass: unequal pouches
(2) Spasmodic hour glass: equal pouches: B
. Disappears after atropine

Clinic: (1) As in pyloric stenosis
(2) Gastric lavage after intubation:
(a) All the fluid cannot be recovered
(b) Recovery of fluid in two parts
(3) X Ray barium meal after antispasmodics

Treat: (A) **Conservative:**
Ind. (a) Early simple cases
(b) Spastic hour glass
Treat. (1) Regular gastric lavage
(2) Antispasmodics: *Octinum*
. *Eupaco*
(3) Dieting

(B) **Surgical:**

Ind: (*a*) Organic cases
(*b*) Obstructive syndrome

Pre oper: As in pyloric stenosis

Tech: (1) **Gastro-jejunostomy:**
. To proximal pouch
(2) **Gastrectomy: partial**
(3) Gastroplasty
(4) Wedge resection
↓ Pyloric occlusion
↓ Gastro jejunostomy
(5) Gastro gastrostomy

(5) PERIGASTRITIS WITH ADHESIONS

Causes: (1) **Gastro-duodenal:** Ulcer, carcinoma
(2) **Extra-gastroduodenal:** Gall bladder
Colon
(3) **Post-peritonitic:** Subphrenic abscess
(4) **Post-operative**

Clinic: (*a*) History of:
(α) Gastroduodenal pathology
or (β) Extra gastroduodenal pathology
or (γ) Previous abdominal sepsis
or (δ) Previous abdominal operation
(*b*) Signs of gastric stasis and dilatation
or Change in the characters of ulcer symptoms
or Jaundice in duodenal adhesions
(*c*) X-Rays

Special sign: **Effect of posture on symptoms:**
: Symptoms worse in position which stretches the adhesions

Treat. (1) Short circuit · **Gastro-jejunostomy**
(2) **Partial gastrectomy**

(6) ULCER-CANCER

Etio. 10–15%

Path. (1) Cancerous ulcer 5–10%
(2) Ulcerative cancer

Clinic. (A) **Changes in the characters of ulcer signs:**
(1) Long history
(2) Loss of periodicity
(3) More rapid recent progress
(4) **Anorexia** → cachexia
(5) **Pain:** Characters changed
(*a*) *Constant*
(*b*) Dull
(*c*) Unrelieved by alkalies
↓ (6) Symptoms of rapid pyloric stenosis

(B) **Special signs:**

(1) X Rays
 (a) Big ulcer > 2 cms.
 (b) Greater curvature ulcer

(2) Test meal
 (a) Total acidity any
 (b) **Free Hcl: absent**
 (c) Persistent occult blood
 (d) Microscope growth cells

(3) Naked eye appearance
 Large ulcer with malignant degeneration in one part

Diff diag (1) Ulcerative cancer
 (a) Short history
 (b) Rapid progress
 (c) Malignant changes in all parts of the ulcer

(2) Cancerous ulcer
 (a) Long history
 (b) Change in the characters of symptoms
 (c) Malignant changes only at a part of the large ulcer

Treat **Partial gastrectomy** with lymphatic area

(7) *PANCREATITIS AND JAUNDICE*

Causes (1) Duodenal ulcer
 (2) Periduodenal adhesions

Treat Cholecyst-enterostomy

(IV) NEW GROWTHS OF THE STOMACH:

(A) BENIGN
 (1) Leio-myoma
 (2) Fibroma
 (3) Adenoma and adeno papilloma

(B) MALIGNANT

(1) SARCOMA·

Etio 1% of all gastric tumours

Varieties (1) Intragastric submucous
 (2) Extragastric subserous, pedunculated
 (3) Diffuse infiltrative

Path (a) Round celled
 (b) Spindle celled
 (c) Lympho-sarcoma
 Late metastases

Treat (1) *Deep X Rays*
 (2) Radium

(2) CARCINOMA STOMACH:

Etio: (*a*) Frequency:
(1) Commonest site for carcinoma
(2) 30% of all male carcinomas
20% of all female carcinomas
(*b*) *Age*: 40 to 70
(*c*) Sex: Males: females :: 3 . 1
(*d*) Heredity
(*e*) Predisposers:
(1) Errors in diet:
: Spices, hot food, tobacco
(2) Achlorhydria: hereditary, familial
(3) **Chronic gastritis**: Atrophic
(4) Chronic gastric ulcer.
(*a*) Greater curvature
(*b*) Cardiac
(*c*) Pyloric
(*d*) Diameter > 2 cms.
(5) Benign growths: adenoma

Path. variet: (1) **Primary** *gastric carcinoma*
(2) **Ulcer-cancer**:
: Malignant degeneration of peptic ulcer
(3) **Secondary**:
: Involvement in perigastric cancer.
(*a*) Gall bladder
(*b*) Pancreas
(*c*) Colon

Macroscopic: (1) **Ulcerative**: Hard, friable, everted, large
(2) **Proliferative**: Soft, friable, cauliflower
(3) **Scirrhous**: Stenosis
(4) **Diffuse infiltrative**: Leather bottle
(5) **Colloid or mucoid**

Microscopic: (*a*) **Spheroidal**
(*b*) Columnar (adeno carcinoma)
(*c*) Colloid
(*d*) Squamous celled: rare

Sites: (1) **Cardiac**:
: Œsophageal obstruction syndrome
(2) **Body**: Hour glass stomach syndrome
(3) **Pyloric**: *Pyloric stenosis syndrome*
(4) **Curvatures**: Gastric ulcer syndrome
Ulcer and cancer areas go together

Spread: (1) **Direct**:
(*a*) Stomach: along lesser curve
(*b*) Adhesions
(*c*) Adherent organ

(2) **Lymphatic:** (*a*) Permeation
(*b*) Embolism
Glands: Coronary, **subpyloric**, suprapancreatic, biliary, **cœliac** superior mesenteric, hilar, para aortic, thoracic duct, **supra-clavicular.**

(3) **Vascular: Liver**, bones

(4) **Trans-cœlomic:** (*a*) Douglas pouch
(*b*) Krukenberg
(*c*) Peritoneum

(5) Implantation:
'Kiss' cancer on opposite wall

(6) Alimentary propulsion: cancer rectum

Common sites for metastases

(*a*) **Glands:** Left supraclaviculars
(*b*) **Liver**
(*c*) **Peritoneum:** Pelvis, omentum
(*d*) **Umbilicus**

Clinical types.

(1) *Gastric type:*

(A) **Cardiac:** Dysphagia with heart burn

(B) ***Body:***

(1) **Acute:** (*a*) Hæmatemesis
(*b*) Acute dyspepsia
(*c*) Perforation

(2) **Chronic:** Dyspepsia with anorexia

(3) **Ulcer:** Change in the ulcer syndrome

(4) ***Obstructive:*** *Rapid signs of obstruction*

(5) **Tumour**

(C) **Pyloric:** Rapid pyloric obstruction

(D) **Diffuse:** Leather bottle stomach
Progressive diminution of capacity

(2) *Regional type.*

(A) **Tumour:** (*a*) Enlarged glands
(*b*) Omental metastases

(B) **Fistulæ:** Gastro colic

(C) **Enlarged liver:** Liver secondaries

(3) *Distant type:* Metastases

(A) Ascitis
(B) Ovarian tumours
(C) **Douglas' pouch**
(D) Umbilicus
(E) **Supraclavicular adenopathy**

(4) *General type:*
(A) **Anæmia + Dyspepsia + Cachexia**
(B) Jaundice

Diagnosis: (1) **History:**
(A) Long: intermittent → remittent
(B) Short: (*a*) Non obstructive: anorexia
(*b*) Obstructive

(2) **Physical examination:**
(*a*) Tumour
(*b*) Dilatation of stomach
(*c*) Metastases. (α) P.R. or P.V.
(β) Neck
(γ) Liver
(δ) Umbilicus

(3) **Special tests:**
(A) **Barium meal:**
(*a*) Irregular contour
(*b*) Filling defect
(*c*) Crater or niche
(*d*) Gastric dilatation or contraction
(*e*) Hypo motility
(*f*) Gastric stasis

(B) **Test-meal:**
(*a*) Primary carcinoma.
: Hypo or a chlorhydria
(*b*) Secondary carcinoma.
: Any chlorhydria
(*c*) Occult blood
(*d*) Growth cells

(C) **Vomit examination:**
(*a*) Stasis of food
(*b*) Occult blood
(*c*) Growth cells

(D) **Stools examination:**
. Occult blood

(E) **Blood examination:**
(*a*) Anæmia
(*b*) Wassermann or Kahn

(4) **Therapeutic test:**
: *Failure of medical treatment for one month, of any acute recent dyspepsia, in a patient past middle age*

(5) **Gastroscopy:** By œsophagoscope or gastroscope

(6) **Laparotomy:**
(*a*) After every available examination
(*b*) Persistent dyspepsia + achlorhydria

Diff diag (A) **Dyspepsias:**
- (a) **Surgical:**
  - (1) Gastric
  - (2) Duodenal
  - (3) Gall bladder
  - (4) Pancreas
  - (5) Appendicular
  - (6) Intestinal obstruction
- (b) **Medical:**
  - (1) Visceroptosis
  - (2) Liver inefficiency
  - (3) Chronic pancreatic inefficiency
  - (4) Uræmia
  - (5) Nervous

(B) **Gastric foci:**
- (1) Chronic gastritis
- (2) Chronic peptic ulcer
- (3) Achlorhydria
- (4) Gastric obstructions

(C) **Abdominal foci:**
- (1) Primary gastric from perigastric carcinoma
- (2) Secondaries diagnosis of the primary

(D) **Distant foci:**
- (1) Diagnosis between primary affections and secondary metastases
- (2) Diagnosis of the primary focus of the secondary metastases

(E) **General diseases:**
- (1) Pernicious anæmia
- (2) Phthisis
- (3) Wasting diseases diabetes
- (4) Neurasthenia
- (5) Thyrotoxicosis

Treat **Operative unless contraindicated**

(A) **Operable cases:**

Pre oper
- (a) Glucose saline infusions
- (b) Blood transfusions
- (c) Gastric lavage

Tech
- (1) Laparotomy midline supra umbilical
- ↓ (2) Exploration
  - (a) Stomach
  - (b) Lymph glands
  - (c) Adhesions
  - (d) Omenta
  - (e) Liver
  - (f) Peritoneum
  - (g) Pelvis

↓ (3) **Treatment of the focus:**

(A) **Radical:**

(1) **Partial gastrectomy:**

(a) Anterior Polya

(α) *Moynihan*

(β) Balfour

(b) Posterior Polya

(α) Finsterer

(β) *Lahey*

(2) **Total gastrectomy:**

Moynihan

(B) **Palliative:**

(1) **Gastrostomy**

(2) Jejunostomy

(3) **Gastro jejunostomy:**

(a) Anterior

(b) Posterior

(4) Exclusion of the growth

(a) Cutting the stomach across

↓ (b) Proximal gastro jejunostomy

(5) Excision of the local growth

(B) **Inoperable cases:**

Contraind (1) **Local:** (a) **High carcinoma**

(b) **Adhesions**

(2) **Regional:** (a) Para aortic glands

(b) **Liver metastases**

(3) **Distant:** (a) **Malignant peritonitis**

(b) **Pelvic metastases**

(c) **Supra claviculars +**

(4) **General:** (a) **Cachexia**

(b) Metabolic debility

Treat **Relief of pain and obstruction:**

(1) Diet fluid and nutritious

(2) Medicines sedatives

Luminal, omnopon, morphia

(3) Gastric lavage

(4) **Deep X-Ray therapy**

(V) ACUTE CONDITIONS OF THE STOMACH:

(1) TRAUMA Rupture, wounds, burns, foreign bodies

(2) ACUTE PHLEGMONOUS GASTRITIS

Etio (a) Corrosives

(b) Alcoholism

(c) Chronic gastritis

(d) Gastric ulcer

Path Acute suppurative streptococcic cellulitis of the stomach wall

Clinic (a) Severe epigastric pain and burning
(b) Vomiting with hæmatemesis
Diff diag (1) Intra peritoneal perforation
(2) Acute pancreatitis
(3) Acute cholecystitis
(4) Pneumonia
Treat (1) Sulphonamide
↓ (2) Laparotomy
↓ Exteriorisation of the stomach
↓ Multiple incisions down to the mucosa
↓ Drainage of the lesser sac
↓ Jejunostomy

(3) ACUTE GASTRIC ULCER (See under Peptic Ulcer)

(4) ACUTE HÆMATEMESIS

(a) Œsophageal varix cirrhosis liver
(b) Acute gastric ulcer distant sepsis with septicæmia
(c) Gastric carcinoma
(d) Gastrostaxis chlorotic young women

(5) ACUTE GASTRIC PERFORATION

(See under Peptic Ulcer)

(6) ACUTE VOLVULUS OF THE STOMACH

Etio Any age and sex
Clinic (A) Acute
(a) Acute pain
(b) Nausea with inability to vomit
(c) Acute dysphagia
(d) Ballooning of the stomach
(e) Stomach tube does not pass
(B) Chronic pyloric obstruction syndrome
(C) Intermittent
Treat Exploration -> Puncture -> Aspirate -> Untwist -> Suture

(7) ACUTE DILATATION OF THE STOMACH

Etio (1) **Post-operative:**
(a) Abdominal
(α) Gastro-duodenal
(β) Biliary passages
(γ) Pelvic organs
(b) Genito urinary
(c) Extremities urgent amputations
(2) **Traumatic:**
(a) Abdominal epigastric
(b) Fractures
(3) **Acute sepsis:** Septicæmia, typhoid
(4) **Spinal:** Fractures and diseases
(5) Visceroptotic **Mesenteric ileus**
(6) Child birth

Theories (*a*) Pylorospasm
(*b*) Excessive secretion
(*c*) **Paralytic**
(*d*) **Superior mesenteric arterial compression**

Path: Distension upto sup mesent arterial crossing

Clinic (1) Initial
(*a*) **Epigastric discomfort**
(*b*) Visible gastric distension
(*c*) Rising pulse rate
↓ (2) Incessant, recurrent, copious, **regurgitant vomits** (Brownish with sweet odour)
↓ (3) **Dehydration** with thirst and **shock**
↓ (4) **Acute distension** of the stomach
↓ (5) Heart and respiratory embarrassment

Diff diag (A) **Of different causes of vomiting:**
(1) Post anæsthetic
(2) Acidosis
(3) Acute peritonitis
(4) High intestinal obstruction
(5) Paralytic ileus
(6) Acute gastritis
(7) Metabolic uræmia
(8) Nervous raised intracranial pressure

(B) **Of different causes of gastric dilatation:**
(1) Pyloric stenosis
(2) Infantile pyloric hypertrophy
(3) Gastric carcinoma

Treat **Postural gastric drainage:**
(1) **Prone Trendelenburg** posture
(2) **Gastric suction drainage** & lavage
With **Ryle's tube**
Via (*a*) **Nose**
(*b*) Mouth
Tech. (*a*) **Continuous**
(*b*) Intermittent
For 36 hours after stomach has regained tone as shown by 'gastric mobility test'
(3) Rectal, subcutaneous and intravenous . 500 c cs normal **saline with glucose**
(4) Drugs pituitrin 1 c.c. every 3 hours
. eserine $\frac{1}{200}$ gr

(8) TABETIC CRISES OF STOMACH

Etio Tabes dorsalis

Clinic (*a*) Acute gastric crises
(*b*) Tabetic stigmata pupils

Diff diag Acute gastro-duodenal lesions

(VI) CHRONIC CONDITIONS OF THE STOMACH:

(1) CHRONIC GASTRITIS:

Varieties (A) **Dietetic**: Alcohol, spices
(B) **Reflex**: Appendicitis, cholecystitis
(C) **Organic**: In association with
(a) Pyloric obstruction
(b) Peptic ulcer
(c) Gastric carcinoma
(D) **Specific**:
(a) Syphilitic:
Dyspepsia in a syphilitic patient
(b) T B
(E) **Plastic**: Leather bottle stomach
Varieties (a) Local
(b) General
Causes (a) Simple fibromatosis
(b) Carcinomatous
Clinic Gradual decrease of gastric capacity
↓ Progressively smaller feeds

Etio (1) **Exogenous**: Mechanical local irritants
(2) **Endogenous**: Toxic irritants

Path (a) **Hypertrophic** → hyperchlorhydria → Peptic ulcer
(b) **Atrophic** → achlorhydria→
(α) Pernicious anaemia
(β) Carcinoma
(c) Superficial
(d) Post operative stomach
After gastro jejunostomy

Clinic **Epigastric distress**:
(a) Burning
(b) Gnawing
(c) Dull pain

With (1) Relation to food immediate to 3 hours
(2) Response to alkaline treatment

Diff diag (1) *Gastro duodenal **peptic ulcer***
(2) Gastric **carcinoma**
(3) **Reflex** gastritis
(4) **Medical** gastritis

Compl (a) Peptic **ulcer**: In hypertrophic gastritis
(b) Gastric **carcinoma**: In atrophic gastritis

Treat (1) Treat the etiology
(2) Gastric sedatives and emollients

(2) GASTRIC FISTULA:

(A) **External gastric fistula**:

Etio: (a) **Gastrostomy**
(b) Carcinoma
Clinic. Extravasation of gastric contents: **Acid**
Diff diag: (1) Duodenal fistula
(2) Biliary fistula
(3) Intestinal fistula
(4) Colon fistula
(5) Pancreatic fistula
Compl: Irritation, digestion and eczema of the skin
Treat: **Alkaline and emollient dressings:**
(a) Starch + egg albumen + olive oil
or (a) Zinc oxide ointment + castor oil
\+ (b) Soda bi carb powder

(B) Internal gastric fistulae.
Varieties. (1) Gastro-colic
(2) Cholecysto gastric gastro biliary
(3) Gastro jejunal
Causes (1) Chronic ulcer
(2) Sepsis
(3) Tuberculosis
(4) Carcinoma
(5) *Operations*
of (1) *Stomach*
(2) Gall bladder
(3) Colon
Path (a) Direct
(b) Indirect intervention of a walled cavity
Clinic (1) Signs of primary conditions ulcer, carcinoma
↓ (2) Signs of fistula Passage of contents both ways
(A) Gastro-colic
(a) Diarrhœa with undigested food
(b) Fæcal vomits
(B) Gastro biliary · biliary regurgitation
(3) Loss of nourishment inanition cachexia
(4) X Rays (a) Barium meal
(b) Barium enema
(c) Cholecystography
Compl (1) Inanition cachexia
(2) Sepsis with chronic toxæmia
Treat (A) Conservative
Ind (a) No distal obstruction
(b) Recent
(c) Inoperable
(d) Pre-operative
Tech (1) Keep the passage-contents
(a) Antiseptic
(b) Dry
(c) Small in quantity
(2) Lavage of the constituent organs
(B) Operative·
Ind (a) Distal obstruction
(b) Failure of conservatism
(c) Operable

Tech (A) Preliminary jejunostomy
↓ Excision of fistula
↓ Restitution of parts
or (B) Partial gastro-colectomy
↓ Gastro enterostomy
\+ Colo-colostomy
or Ilio-sigmoidostomy

(3) GASTROPTOSIS

Varieties (1) **Primary :** Visceroptotic
(*a*) Congenital
(*b*) Acquired
(2) **Secondary :** To chronic gastric dilatation

Clinic (1) **Dyspepsia :** With neurasthenia
(2) **Decubitus :**
(*a*) Virginal narrow subcostal angle '*Drooping lily*' build
(*b*) Maternal protuberant lower abdomen in a multipara.
(3) **X-Rays** ·
(*a*) **Lesser curvature below umbilicus**
(*b*) Hypomotility
(*c*) Stasis

Diff diag (1) Organic gastric lesions ulcer, carcinoma
(2) Dyspepsias medical and surgical
(3) Nervous diseases

Compl (1) Gastritis
(2) Superior mesenteric ileus
(3) Unindicated, meddlesome surgery

Treat (A) **Conservative :**
Belt physiotherapy, tonics
↓ (B) Operative
Gastro duodenostomy
(No gastro-jejunostomy)

(4) GASTRIC VENTRAL HERNIA

Def Inclusion of the stomach in
(*a*) Median epigastric hernia
(*b*) Umbilical hernia
(*c*) Ventral hernia

Clinic (1) Dyspepsia Associated with food
(2) Posture factor
Exaggeration of symptoms in recumbent position
(3) Hernia Palpable or impalpable

Treat Radical operation

(5) GASTRIC DIVERTICULA

Etio Rare

Cause Penetrating ulcers

Clinic (a) Gastric dyspepsia
(b) X Rays Barium meal
(1) Presence of barium at a constant place after emptying of the stomach
(2) Demonstration of gastric barium contents beyond the limits of gastric outlines
(6) LYMPHO-GRANULOMA OF STOMACH

(B) THE DUODENUM

(I) CONGENITAL ABNORMALITIES

(1) DUODENAL ATRESIA Persistent septum
Site Level of ampulla
Cause Junction of foregut and midgut
Clinic Pyloric obstruction syndrome
With (a) Vomiting from birth
(b) Presence of bile in vomit
(c) No palpable tumour

(2) DUODENAL DIVERTICULA
Varieties (A) True Congenital
(B) False Acquired
(α) Ulcers
(β) Bands and adhesions
Sites (A) True near the ampulla
(B) False weak spots along inner aspect
Associated (1) Visceroptosis
(2) Chronic duodenal ileus
Clinic (a) Latent
or (b) Pressure syndrome
(α) Duodenal obstruction syndrome
(β) Bile ducts jaundice
+ (c) X Rays barium meal
Compl (1) Inflammation
(2) Ulceration
(3) Perforation
(4) Hæmorrhage
Treat (a) Leave alone if latent
(b) Pyloric occlusion + gastro jejunostomy
(c) Excision → Invagination of the stump

(3) DUODENAL BANDS
Varieties (A) Congenital Hepatico-duodenal fold (Importance in cholecystectomy)
(B) Acquired inflammatory
Clinic (1) Latent
(2) Pyloric obstruction syndrome
(3) X Rays

(4) DUODENAL ILEUS
(A) **Acute gastro duodenal ileus**
(See acute dilatation of stomach)

(B) Chronic duodenal ileus:

Def: Distension of duodenum and pylorus with stasis

Etio: Visceroptosis

Causes: (1) Pressure of:
- (a) **Root of the mesentery** } prolapsed
- (b) **Superior mesenteric vessels** } cæcum
- (c) Chronic inflammatory lesions
- (d) Congenital bands

(2) Angulation: due to visceroptosis

Association. **Visceroptosis**

Clinic
- (a) Females with visceroptosis
- (b) **'Weak stomach' with 'bilious attacks'**
- (c) Relief by rest and recumbency
- (d) X-Rays: *'writhing duodenum'*

Diff diag **From dyspepsias:**
1. Gastro-duodenal ulcer with stenosis
2. Appendicular dyspepsia
3. Cholecystitic dyspepsia
4. Pancreatic dyspepsia
5. Colonic dyspepsia

Compl
- (a) Gastro-duodenal dilatation
- (b) Biliary and pancreatic infection

Treat (1) **Conservative:**
- (a) Rest in bed with foot raised
- (b) Dieting
- (c) Physiotherapy and appliances
- (d) Gastric aspiration and lavage

(2) **Operative:**
- (a) **Duodeno-jejunostomy**
- (b) **Cæcopexy:** In prolapsed cæcum

(No gastro-jejunostomy)

(II) TRAUMA:

RUPTURE DUODENUM.

Etio
- (a) Run-over accidents
- (b) Blows on epigastrium
- (c) Stab wounds

Path (1) Intra-peritoneal:
- Acute perforative spreading peritonitis

(2) Extra-peritoneal
- . Retroperitonitis

(3) Combined or complete

Clinic
- (a) Acute perforative peritonitis
  In intra-peritoneal rupture
- (b) Acute retro-peritonitis
  In extra-peritoneal rupture

Treat (1) Exploration

Signs (a) Intra-peritoneal rupture
- . Peritonitis with biliary extravasation

(b) Retro peritoneal rupture
(a) Hæmorrhagic extravasation
(β) Hæmorrhagic petechiæ
(γ) Fat necrosis
+ (2) Suture of the rupture
+ (3) Gastro jejunostomy } if required
+ (4) Drainage of periduodenal space
or (2) Closure of both duodenal ends } in complete rupture
+ (3) Gastro jejunostomy
Post. compl Duodenal fistula

(III) INFLAMMATION

(1) CHRONIC DUODENITIS
linic (a) Duodenal ulcer syndrome
(b) Achlorhydria
iag Peptic ulcer

DUODENAL ULCER
(A) Acute duodenal ulcer
yn Curling's ulcer
tio Extensive burns
te Second part opposite ampulla
ath Toxic—(Excretion via common bile duct)
Clinic (1) Presence of extensive burns or acute toxæmia
(2) Hæmatemesis or melæna
Treat Conservative
(B) Chronic duodenal peptic ulcer
(See under Stomach)

(IV) DUODENAL FISTULA

(1) EXTERNAL DUODENAL FISTULA

Causes (1) **Post operative** Operations on
(a) Gall bladder and biliary ducts
(b) Duodenum
(c) Kidney
(2) **Trauma** Rupture
(3) **Perforation**
Clinic (a) History
(b) Position of the stoma right upper abdomen
(c) **Discharge Alkaline** yellowish irritating
(d) X Rays
Diff diag (1) **Gastric fistula** Acid colourless
(2) **Gall bladder fistula** Alkaline
Biliary or mucous
(3) **Jejunal fistula**
(4) **Fæcal fistula** Colon
(5) **Umbilical fistula**
Compl (a) Irritant dermatitis
(b) Starvation cachexia

Treat (1) **Conservative:**
- (a) Restriction of fluids and diet
- (b) Protection of skin
  - (α) Zinc oxide + castor oil
  - (β) 30% calomel in lanolin
  - (γ) Paste of kaolin and water
- (c) **Suction drain continuous**
- (d) Indwelling Einhorn tube

(2) **Operative:**
- (a) Closure if after gastrectomy
- (b) **Pyloric exclusion:**
  - **+ Gastro jejunostomy**
- (c) Jejunostomy

(2) INTERNAL DUODENAL FISTULA

Syn Natural duodeno-cholecystostomy

Etio
- (a) Operative
- (b) Traumatic
- (c) Inflammatory Gall stones
- (d) Carcinoma
  - (α) Gall bladder
  - (β) Hepatic flexure duodeno-colic

Clinic
- (1) Duodeno-cholecystic
  - Latent
- (2) Duodeno-colic
  - Passage of undigested food per anum

Treat
- (1) Duodeno-cholecystic
  - Leave alone
- (2) Duodeno-colic
  - Gastro-jejunostomy + Ileo transverse colostomy

(V) NEW GROWTHS:

(1) INNOCENT All rare

Varieties
- (a) Adenoma
- (b) Myoma
- (c) Fibroma
- (d) Lipoma

Clinic
- (1) Vague abdominal symptoms
- (2) Peptic ulcer syndrome
- (3) Pyloric stenosis syndrome
- (4) Biliary obstruction syndrome

Treat Excision + gastro jejunostomy

(2) MALIGNANT Carcinoma rare

Sites
- (1) Peri-ampullary
- (2) Infra-ampullary
- (3) Supra ampullary

Path
- (A) Cylindrical-celled ad
  - Brunner's glands
- (B) Spread (a)
  - (b)

Clinic (1) Supra-ampullary Very rare
Pyloric obstruction syndrome
(2) Peri-ampullary
Pancreatic carcinoma syndrome
(a) Persistent progressive jaundice
(b) Enlarged gall bladder and liver
(c) Biliary sepsis
(d) Cachexia
(3) Infra ampullary
Duodenal ileus syndrome
(a) Bilious vomits
(b) Gastro-duodenal dilatation
(c) Cachexia
Diag X Rays barium meal duodenal filling defect
Treat (A) Inoperable
(a) Gastro jejunostomy
+ (b) Cholecyst-gastrostomy
(B) Operable Excision + anastomosis
Post compl (1) Jaundice
(2) Duodenal fistula

(C) GASTRO-DUODENAL OPERATIONS

) PRE-OPERATIVE CONSIDERATIONS:

(1) BEST TIME TO OPERATE
(A) Operations of urgency immediate
(B) Operations of choice after a period of preparation

(2) **Pre operative preparation:**
(A) **Hygiene of the mouth:**
(a) Removal of septic foci
(b) Frequent gargles
(B) **Medical treatment** Of gastro duodenal focus
(a) Alkaline powders
(b) Olive oil, belladonna
(C) **Diet:** Sippy, nutritious liquid diet
(D) **Intestinal precautions:**
(a) Laxatives
(b) Intestinal antiseptics
(E) **Respiratory precautions:**
Prophylactic anti pneumonic treatment
Anticatarrhal vaccine
Deep breathing exercises
(F) **Urinary precautions:**
(a) Hydrotherapy
(b) Urinary antiseptics and diuretics

Treat · (1) **Conservative:**
- (a) Restriction of fluids and diet
- (b) Protection of skin
  - (α) Zinc oxide + castor oil
  - (β) 30% calomel in lanolin
  - (γ) Paste of kaolin and water
- (c) **Suction drain: continuous**
- (d) Indwelling Einhorn tube

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- (b) Traumatic
- (c) *Inflammatory Gall stones*
- (d) Carcinoma
  - (α) Gall bladder
  - (β) Hepatic flexure duodeno-colic

Clinic (1) Duodeno-cholecystic
Latent
- (2) Duodeno-colic
  Passage of undigested food per anum

Treat (1) Duodeno-cholecystic
Leave alone
- (2) Duodeno-colic
  Gastro-jejunostomy + Ileo transverse colostomy

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- (b) Myoma
- (c) Fibroma
- (d) Lipoma

Clinic (1) Vague abdominal symptoms
- (2) *Peptic ulcer syndrome*
- (3) Pyloric stenosis syndrome
- (4) Biliary obstruction syndrome jaundice

Treat Excision + gastro jejunostomy

(2) MALIGNANT Carcinoma rare

Sites (1) Peri-ampullary
- (2) Infra-ampullary
- (3) Supra ampullary

Path (A) Cylindrical-celled adeno-carcinoma from mucosal
Brunner's glands
- (B) Spread (a) Along the lumen
  - (b) Around the lumen obstruction

Clinic (1) Supra-ampullary Very rare
• Pyloric obstruction syndrome
(2) Peri ampullary
Pancreatic carcinoma syndrome
(a) Persistent progressive jaundice
(b) Enlarged gall bladder and liver
(c) Biliary sepsis
(d) Cachexia
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Duodenal ileus syndrome
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Anticatarrhal vaccine
Deep breathing exercises
(F) **Urinary precautions:**
(a) Hydrotherapy
(b) Urinary antiseptics and diuretics

(G) **Circulatory precautions:**
- (*a*) Blood coagulants
- (*b*) Hæmatinic tonics
- (*c*) **Blood transfusion**

(H) **Metabolic precautions:** Hydro glucose therapy
- (*a*) Fluids.
  - (α) Mouth: ad lib.
  - (β) Rectum: Murphy
  - (Γ) Intravenous 5000 c cs. in 24 hours
- (*b*) Glucose:
  - (α) Mouth: 200 c.cs. of 10% glucose in 1% sodium chloride sol. T.D.S.
  - (β) Intravenous: 25 c.cs. of 20% glucose B.D.

(3) **Special investigations:**

(A) ***Gastric test meal***

(B) **X-Rays:** Barium meal

(C) **Blood:**
- (*a*) Cell count and hæmoglobin
- (*b*) Blood sugar
- (*c*) Blood urea
- (*d*) Wassermann
- (*e*) Coagulation and bleeding time

(D) **Heart and circulation:**
- (*a*) Heart
- (*b*) Blood pressure

(E) **Stools** examination

(F) **Urine** examination

(G) **Rectal** examination

(4) **Special steps:**

(A) **Gastric lavage:** Obstructive lesions

(B) **Gastric aspiration:**
- (*a*) Obstructive lesions
- (*b*) General anæsthesia
- (*c*) Pronounced vomiting

(C) **Medicines:**
- (*a*) Alkalies: in hyperchlorhydria
- (*b*) Hcl: in achlorhydria

(D) Avoidance of soda bi-carb + Supply of chlorides: (*a*) Hcl. by mouth (*b*) Hypertonic saline } in pronounced vomiting

(E) Anti shock measures: if necessary

(5) **Immediate pre-operative treatment:**

(A) **Stomach wash:**

Tech Ryle's tube

Time (a) Previous evening
(b) Three hours before operation
(c) Immediately before and during operation
If vomiting is pronounced
Combine with suction drainage

(B) **Hydro glucose therapy·**

Time From previous evening

Tech (a) Mouth sterile water sips
(b) Rectum tap water
(c) Venous glucose saline

(C) **Diet precautions:**
Nothing by mouth for three hours before operation

(D) **Sedatives:**
(a) Hypnotic previous night
(b) Omnopon $\frac{1}{3}$ gr one hour before
(c) Morphia 1/4 gr + atropine 1/100 gr
Half an hour before

(E) **Skin preparation:**
From clavicle to mid thighs

(F) **Catheterisation.** If necessary

(G) **Ryle's tube**
For suction drainage of stomach just before, or/and, during the operation
If necessary

(6) **Anæsthesia:**

(A) General

(B) Regional (a) Spinal
(b) **Field block + splanchnic**

(C) Local + splanchnic

(II) OPERATIVE TECHNIQUE:

(1) Incisions
(a) Midline Exploration
(b) Right paramedian Pyloro-duodenal lesions
(c) Left paramedian body of the stomach lesions
(d) Left subcostal cardiac end lesions
(e) Right trans rectus
(f) Left trans rectus
(g) Transverse epigastric

(2) Ligatures
(a) Intestines
No 0-00 20 days chromic catgut

(b) Omentum, gastric vessels and peritoneum:
No. 2: Chromic catgut
(c) Muscles
No 1-2 Chromic catgut
(d) Skin Fine silk-worm gut
(3) Needles
(a) (Souttar's atraumatic needle).
For viscera and peritoneum
(b) Round bodied
For extraperitoneal structures
(c) Cutting
For skin and subcutaneous tissues

(4) **Clamps:**
(a) Payr clamps
(b) Sherren clamps
(c) De Petz clamps
Ind Thick, dilated stomach
Contraind (a) Thin, friable, small stomach
(b) Gastro duodenostomy
(c) Œsophago jejunostomy

(5) **General exploration:**
(a) **Stomach and duodenum**
(b) **Liver and biliary apparatus**
(c) Transverse colon and both flexures
(d) Spleen
(e) Pancreas
(f) Kidneys
(g) **Appendix and Meckel**
(h) Cæcum and ascending colon
(i) Small intestines
(j) Descending, sigmoid and pelvic colon
(k) Rectum
(l) **Pelvic organs**
(m) Ureters

(6) **Exploration of the focus:**
(A) **Chronic peptic ulcer:**
(1) Adhesions fibrous, omental
(2) Puckering
(3) Opacity
(4) Roughness
(5) Induration without friability
(6) Red speckling
(7) Sentinel gland
(B) **Carcinoma:**
(1) Nature of the growth:
Ulcer or tumour or scirrhous
(a) Large size
(b) **Site: greater curvature**
(c) Induration with friability

(d) No red speckling
(c) **Everted edges**
(2) Adhesions to and **infiltration** into neighbours
(3) Glandular involvement.
+ white infiltrated lymphatics
(4) Secondary complications
: Obstruction, perforation
(5) **Metastases:**
. Peritoneum, omentum, liver, pelvis, ovaries

(7) **Determination of operability:**
(A) Local condition
(B) Regional condition
(C) Distant condition
(D) General condition:
(a) Present
(b) Future . till the end of the operation

(8) **Determination of the nature of the operation:**
(A) Urgent relieving . suture of perforations
(B) Palliative · gastrostomy
: gastro enterostomy
(C) Radical: gastrectomy

(9) **Operation itself**

(10) **Closure:**
(a) **Never forget to count the abdominal mops before closing**
(b) Complete relaxation of abdominal wall is essential
(c) Additional factors in relaxation
(α) Flexion of thighs
(β) Deep breathing

(III) DIFFERENT GASTRO-DUODENAL OPERATIONS:

(1) GASTRIC ASPIRATION DRAINAGE.

Ind: (A) **Repeated vomiting:**
(a) Intestinal obstruction
(b) Peritonitis
(c) Acute dilatation of stomach
(d) Post operative vomiting
(B) **Gastric lavage**

Routes: (1) **Nasal**
(2) Oral

Tubes: (a) **Ryle's**
(b) Levine's
(c) Bailey's

Methods: (1) Intermittent
(2) Continuous:
(a) Keep the tube in

(b) Removal after 'gastric mobility test'
(c) Replacement whenever distension or retching occurs

Test 'Gastric mobility test'.
(a) ½ pint of coloured barley water to be drunk
(b) Aspirate after ¼ an hour
(c) Note the colour

Drainage (1) Gravity evacuation
(2) Syringe aspiration
(3) Suction apparatus

(2) RAMSTEDT PYLOROPLASTY

Ind Congenital hypertrophic pyloric stenosis
Time Not too late
Pre-oper (a) Regular gastric lavage with sterile saline
(b) Subcutaneous and rectal saline
(c) Blood transfusion 20 c cs. for each kilo of body weight
(d) Glucose-saline infusions
(e) Anti shock precautions
(f) Small frequent feeds
Anæsth (1) General ether
(2) Local
Tech (a) Gastric suction
(b) Incision (α) Midline
or (β) Right paramedian
(c) Isolation by packs
(d) Sphincter split
(α) Incision on the anterior aspect of gastro-duodenal junction from duodenum towards pylorus
(β) Blunt separation of sphincter muscle fibres Till muc mem. protrudes through
(γ) Take care of the duodenum
(e) Compression of the stomach
Post treat (1) Keep warm
(2) Diet 3 hour feeds
(a) Glucose 7.5% in saline drachm i -> ounces ii
(b) Milk with barley water and soda citras
(3) Hydrotherapy Dextrose-saline
(a) Mouth
(b) Rectum
(c) Veins
Compl (See under Hypertrophic pyloric stenosis)

(3) OPERATIONS FOR PEPTIC GASTRIC AND DUODENAL ULCERS

(A) PYLORIC EXCLUSION OR OCCLUSION

Ind (1) Addition to gastro jejunostomy In non-obstructive cases
(2) Inoperable pyloric carcinoma

Tech (A) Ligature
(a) Kelling Mayo
Silk mattress sutures
(b) Wilms
Silk ligature → autoplastic graft
(B) Crush and ligature Bier
Crush → silk ligature → infolding
(C) Division and closure Devine
(a) Division of stomach
↓ (b) Closure of pylorus
↓ (c) Proximal gastro jejunostomy
(D) Excision and closure Finsterer RzA
(a) Partial gastrectomy
↓ (b) Pyloric exclusion

(B) EXCISION OF GASTRIC ULCER
Ind Addition to gastro jejunostomy
In cases with normal acid curve
Tech (A) Cautery
Ind (a) Cardiac ulcer
(b) Posterior wall ulcer
(B) Wedge resection
Ind Lesser curve ulcer
(C) Sleeve resection
Ind (a) Saddle ulcer
(b) Gastric body ulcer
(D) Transgastric excision
Ind Posterior wall ulcer
\+ Adherence to pancreas
Steps (1) Exposure and mobilisation of the ulcer
(2) Isolation of the ulcer area
By (a) Stomach clamps
(b) Packs
(3) Cauterisation or excision of
(a) The ulcer
(b) Ulcer bearing area
(4) Ligature of arteries veins and omenta
(5) Closure of the rent
(a) Purse-string
(b) Linear (α) Inner all coats
(β) Outer seromuscular
\+ (6) Gastro jejunostomy

(C) PYLOROPLASTY GASTRO DUODENOSTOMY
Ind (1) Chronic juxta pyloric stenosing ulcer
With mobilisable duodenum
(2) Recurrent hæmatemesis
(3) Gastro jejunal or jejunal ulcer
(a) Preventive
(b) Curative

Contraind Extensive periduodenal adhesions,
With immobile duodenum

Tech (1) Horsley Heineke Mikulicz Verticalisation
Transformation into vertical of a transverse incision with its centre at the pylorus

(2) Judd Pylorectomy + duodenoplasty
- (a) Mobilisation of duodenum
- (b) Excision of
  - (α) Anterior ⅔rds of pyloric sphincter
  - (β) Cap of the duodenum
  - (γ) Ulcer and scar
- (c) Anastomosis

(3) Finney Side to-side gastro-duodenostomy
- (a) Mobilisation of pylorus and duodenum
- (b) Three stay sutures
- (c) Posterior sero muscular
- (d) Horse-shoe incision
- (e) Posterior all coats
- (f) Anterior all coats
- (g) Anterior sero muscular

(4) Jaboulay Anterior gastro-duodenostomy
Anastomosis of anterior wall of the stomach with the anterior wall of the mobilised duodenum, over the pylorus

(D) GASTRO-JEJUNOSTOMY

Ind (1) **Gastric and duodenal peptic ulcer:**
- (a) Failure of medical treatment
- (b) Onset of complications
  - (α) **Pyloric stenosis**
  - (β) Hour glass stomach
  - (γ) Chronic perforation
  - (δ) Recurrent hæmorrhage
- \+ (c) Absence of
  - (α) Hyper acidity
  - (β) Hyper mobility
  - (γ) Recent history

(2) **Gastro-duodenal obstructions:**
- (a) Intra lumen new growths
- (b) Muscular (α) Fibrous
  (β) New growths
- (c) Extragastric (α) Adhesions
  (β) New growths

(3) **Carcinoma pylorus:**
- (a) In addition to Polya
- (b) Preliminary to gastrectomy
- (c) Palliative

Effects: (1) **Relief of obstruction:**
(a) Mechanical
(b) Physiological
(2) *Relief of pain and spasm*
(3) Neutralisation of hyperacidity
(4) Improvement of nutrition

Varieties: (a) **Posterior no-loop isoperistaltic**
(b) Anterior no loop
(c) Posterior long loop } with entero
(d) Anterior long loop } anastomosis
(e) Retrocolic anterior
(f) Roux Y

Steps: *Of posterior no loop isoperistaltic.*
(1) General exploration
(2) Gastro duodenal exploration
(3) **Demonstration of the ulcer**
(4) Withdrawal of transverse colon
(5) Incision of transverse mesocolon:
: (Save middle colic artery)
(6) Withdrawal of posterior gastric wall
(7) **Clamping** of posterior gastric wall:
(a) **From curvature to curvature**
(b) **In line with cardiac right edge**
(8) Exploration of duodeno jejunal flexure
(9) **Clamping** of jejunum:
(a) **4"-6" from the flexure**
(b) **Along the long axis**
(10) Isolation and approximation (extra-abdominal) of clamped viscera
(11) Anchor sutures
(12) Posterior sero muscular sutures: 4"
(13) Opening:
(a) Gastric } $\frac{1}{4}$" from suture line
(b) Jejunal }
(Ligature gastric vessels separately)
(14) Posterior all coats suture
(15) Anterior all coats suture
(16) **Loosening of clamps:** Observe bleeding
(17) Anterior sero muscular sutures
(18) Suture mesocolic edge to the stomach:
: $\frac{1}{2}$" proximal to anastomosis
(19) Return the viscera in the abdomen
(20) Closure

(4) OPERATIONS FOR CARCINOMA STOMACH:

(A) PARTIAL GASTRECTOMY.

Ind: (1) **Chronic peptic ulcer:**
(a) Pyloric

(b) **Duodenal**
(c) **Anastomotic**
(d) Jejunal
With (α) Hyperchlorhydria
(β) Hypermobility
(γ) Recent history
(2) Hour glass stomach
(3) **Carcinoma stomach**
(4) Gastro colic fistula
Extent (a) **Non malignant lesions**
(α) Duodenum one inch
(β) Stomach
(1) Sleeve
or (2) Proximal healthy margin
or (3) Distal two thirds
(b) **Malignant lesions**
(α) Duodenum first part
(β) Stomach
(1) Whole of lesser curve
(2) Half of greater curve
(3) Ulcer bearing area
(γ) Omenta lesser and greater
(δ) Regional lymph glands
(1) Pyloric supra infra retro
(2) Coronary upper lower
(3) Paracardial right
(4) Gastro epiploic right
Steps (A) **Gastrectomy**
Tech (1) General exploration
(2) Gastro-duodenal exploration
(3) Opening into lesser sac
Through gastro colic omentum
(4) Division of posterior adhesions
Mobilisation of stomach
(5) Division of gastro colic omentum
Close to the colon
Ligature of gastro epiploic vessels
(6) Duodenal
(a) Mobilisation
(b) Division between clamps
(c) Closure of the distal stump
(7) Division of gastro hepatic omentum
(a) Ligature pyloric artery
(b) Division of upper border near liver
(c) Ligature coronary artery

(8) Clamping of the stomach
Right margin of cardiac orifice
↓ Vertically down
(9) Isolation and clamping of jejunal loop

(B) **Anastomosis**

Varieties (1) **Billroth I** Schoemaker
End to end gastro duodenostomy
(2) **Billroth II**
(*a*) Gastric & duodenal stump closure
↓ (*b*) **Side to side gastro jejunostomy**
(3) **Polya**
End to side gastro jejunostomy

Methods (1) Billroth I
(A) End to-end gastro-duodenostomy
(B) Schoemaker Special clamps
(*a*) Excision of
(α) First part of duodenum
(β) Pylorus
(γ) Whole lesser curve
(*b*) Reconstruction of lesser curve
(*c*) End to end anastomosis
(C) Haberer Finney
(*a*) Closure of duodenal stump
(*b*) Anastomosis of stomach to anterior wall of duodenum
(2) Polya End to-side gastro jejunostomy
(A) Anterior or ante-colic
Tech (1) Polya Moynihan Retro-peristaltic
(*a*) Short loop
(*b*) Afferent loop at greater curve
(2) Polya Balfour Iso-peristaltic
(*a*) Long loop 12" from flexure
(*b*) Afferent loop at lesser curve
(*c*) Anastomosis between loops
(3) Polya Hofmeister (Med. Ann 1910)
(*a*) Ante colic
(*b*) Closure of ⅔rd of gastric stoma
(*c*) No entero enterostomy
Results (α) Moynihan
Pressure on colon
(β) Balfour
Stasis in loops
(γ) Hofmeister
No too rapid unloading
(B) Posterior or retro-colic
Tech (1) Polya proper
Iso-peristaltic anastomosis of gastric stoma and jejunum

(2) Finsterer Spur
  (a) Closure of upper half of gastric stoma
  (b) Anastomosis of lower half of gastric stoma and proximal jejunum through mesocolic stoma
(3) Lahey No tension on suture line
  (a) Incision of Treitz lig
  (b) Transplantation of proximal jejunal loop above the mesocolon
  (c) Anastomosis

Tech (1) **Polya-Moynihan :**
: Ante-colic, no loop, retro peristaltic
  (a) Sero muscular suture between :
    (α) Posterior wall of stomach
    (β) Jejunum
  (b) Distal clamping of stomach
  (c) Incision of
    (α) Posterior wall of stomach
    (β) Jejunum
  (d) Posterior all coats suture
  (e) Division of anterior wall of stomach
  (f) Anterior all-coats suture
  (g) Anterior sero muscular suture

(2) **Finsterer :**
: Retro colic, long-loop, iso-peristaltic with spur
  (a) Divide stomach between clamps
  (b) Close upper half of gastric stoma
  (c) Anastomosis
    (1) Opening in the mesocolon
    (2) Draw up long jejunal loop
    (3) Suture of left margin of mesocolic opening to posterior gastric wall
    (4) Stitch up proximal jejunum to upper closed part of gastric stoma
    (5) Anastomose jejunum 6"—8" from flexure to the lower open part of gastric stoma
    (Proximal part to upper angle)
    (6) Suture of right margin of mesocolic opening to anterior gastric wall

(B) TOTAL GASTRECTOMY Moynihan

Ind. (1) Leather bottle stomach
(2) High and extensive malignancy

Steps (1) Mobilisation of stomach
(2) Distal division of stomach
(3) Closure of duodenal stump
(4) Œsophago-jejunostomy
(5) Proximal division of stomach

Difficulties (a) Great depth
(b) Short proximal stump
(c) Absence of serous coat in œsophagus
(d) Friability of œsophageal wall
(e) Tendency to retraction

(5) GASTROSTOMY

Def. Fistula between stomach and abdominal wall for the purpose of artificial feeding

Ind. (1) **Dysphagia:** Due to diseases of
(a) Mouth. carcinoma
(b) *Pharynx and larynx: carcinoma*
(c) Œsophagus ulcer, stenosis, carcinoma
(d) Cardia carcinoma
(2) Introduction of radium

Varieties (A) Temporary serous coat lined
(B) Permanent. palliative. mucous coat lined

Best time (1) After inability to swallow solid food
(2) Before extreme starvation

Best site. (a) Away from pylorus
(b) Away from primary focus: carcinoma
(c) Midway between curvatures

(A) **Temporary gastrostomy:**

(1) **Senn:** *Safety ink pot*
(a) Local anæsthesia
(b) **Left rectus-split** exposure
(c) *Withdrawal and isolation of stomach*
(d) Incision into the stomach
(e) Insertion and **anchoring** of catheter
(f) Series of burying **purse-string** catgut sero muscular sutures
(g) **Fixation** of stomach to parietal peritoneum
(h) Suture of the wound
With tube emerging at the lower end

(2) Kader *Ditch*
Two vertical and parallel sero muscular folds of anterior gastric wall drawn together above and below the entrance of the tube

(3) Witzel *Tunnel*
Ind Small tubular stomach

Tech Burial of the tube in the groove of stomach wall for two inches from its entrance into the cavity folds of the wall being stitched over

(B) **Permanent gastrostomy**·

(1) **Frank** *Subcutaneous cone*

(a) Incision (α) Parallel to costal margin
or (β) Along linea semilunaris

(b) Withdrawal of a cone of ant gastric wall

(c) Suture around the cone base
(α) Parietal peritoneum
and (β) Post rectus sheath

(d) *Transverse incision* above the costal margin

(e) Drawing up and opening of the cone apex
(α) Subcutaneously
or (β) Trans rectus

(2) Janeway *Gastric flap*
Catheter lying in a newly constructed tube of an ant. gastric wall flap anchored to the rectus sheath and opened on the skin surface.

(6) DUODENO-JEJUNOSTOMY

Ind Chronic duodenal ileus
Due to pressure by sup mesent art

Tech (a) Mobilisation of third part of duodenum
(b) Lateral anastomosis of
(α) Duodenum
(β) Jejunum

Steps (1) Transverse incision over the duodenum through the mesocolon
(2) Mobilisation of duodenum
(3) Clamping of (a) Duodenum 3rd part
(b) Jejunum 7" from flexure
(4) Anastomosis Retro peristaltic
(5) Save (a) Right colic artery
(b) Sup mesent vein

(7) GASTRO-DUODENAL EMERGENCIES

(A) GASTRO-DUODENAL PERFORATION

Pre oper (a) Morphia + atropine
(b) Continuous intravenous saline

Anasth (1) **Local** novocain infiltration
+ (2) Intravenous evipan
At the time of peritoneal incision
or (3) Spinal

Operation (1) **Exploration**
↓ (2) **Suture**

↓ (3) **Peritoneal toilet**
↓ (4) **Drainage:** Not required in early cases
(a) Local
(b) Suprapubic

Steps: (1) **Incision:** (a) **Midline**
or (b) Right paramedian
: (α) Small. diagnostic
↓ (β) Large: therapeutic

(2) **Search:** For the perforation
(a) Incision of the peritoneum
(α) Escape of gas
(β) Escape of fluid
(b) **Diagnosis of site:**
(α) **Spot from which fluid wells**
(β) Follow increasing inflammation
(γ) Adhesions, induration, redness
(δ) **Inspect and palpate:**
(1) Anterior gastric surface
(2) Duodenum
(3) Whole of the lesser curve
(4) Posterior gastric surface
. Via gastro colic omentum

(3) **Isolation of the area:**
By: (a) Clamps if possible
(b) **Mops:** Arranged all around

(4) **Closure of the perforation:**
(a) Suture. No 1–2, 20 days catgut
(b) Needle: Round bodied eyeless
(c) Introduction: in healthy tissues
(d) Suture: (1) Interrupted mattress
(2) Purse string

(5) **Free omental graft or plug**

(6) **Look for other perforations**

(7) **Peritoneal toilet:** Not very necessary (H. Bailey)
(a) **Electric suction**
(b) *Dry mopping*
(c) Take particular care of:
(1) Subphrenic spaces
(2) Rutherford Morison's pouch
(3) Lesser sac
(4) Paracolic gutters. right

(5) Right iliac fossa
(6) Pelvis

(8) **Drainage:**

Ind: (a) Doubtful cases
(b) **Much extravasation**
(c) Insufficient toilet
(d) **Duration > 12 hours**

Sites: (1) **Rutherford Morison's pouch**
(2) Lumbar gutters
(3) **Suprapubic**
(4) Operation wound

Time: 48–72 hours

(B) GASTROTOMY.

Ind: (1) **Foreign bodies:**
(a) Nature, shape and size
(b) Fear of **perforation**
(c) Impaction with **obstruction**
(d) **Stasis** for more than 48 hours
(2) Intra gastric treatment of ulcers:
(a) Cautery
(b) Ligature of vessels
(3) Dilatation of achalasia cardia

Steps: (a) Laparotomy
(b) Exploration of stomach: from outside
(c) Treatment of the focus: foreign body
(1) Manipulation into an accessible part
(2) Isolation by clamp and pads
(3) Incision and withdrawal
(4) Closure of the stomach: two layers
(5) Closure of the wound

(IV) POST-OPERATIVE TREATMENT OF GASTRO-DUODENAL OPERATIONS:

(1) **Position:**
(a) High or low **Fowler**
+ (b) *Flexion of the hips*

(2) **Oral hygiene:**
(a) Frequent **gargles**
(b) Lemon to suck

(3) **Chest prophylaxis:** Anti pneumonic treatment
(a) CO_2 or Tr. Benzoin Co inhalations or **deep breaths**
(b) **A.S.A.:** Atropine sulph. 1/200 gr.
Strych hydrochlor. 1/50 gr.
Adrenaline hydrochlor. 10 min.
(c) Camphor in-oil or Transpulmin
(d) M. & B. 693

(C) **Gastrostomy:**

Position (*a*) Lying down on back
(*b*) Lying on right side

Food Three ounces of peptonised milk every three hours
Beaten egg yolk
Strained orange, tomato or grape juice
Glucose
Iron mixture, Halibut liver oil, marmite

Point Run down water through the tube after every feed

(7) **Medicines:**
(*a*) For post operative complications . hiccough etc.
(*b*) For primary conditions ulcer
(*c*) For deficiencies Hcl in gastrectomy

(8) **Rectum:**
(*a*) Flatus tube when and if required
(*b*) Enema 4th morning → alternate days
(*c*) Liquid paraffin from fifth night
(*d*) Laxatives after tenth day

(9) **Dressings:**
(A) **No tube:** Dry dressings changed twice in 10 days
(B) **Tube:**
(*a*) **Prophylactic:** Removal in 48 hours
(*b*) **Peritoneal drain:** Removal in 72 hours
If discharge daily shortening
(*c*) **Gastrostomy tube:**
(1) Removal after 10th day
↓ (2) Daily removal → cleansing → re insertion
↓ (3) Left out at night after one month
(4) Gastrostomy plug when required
(5) Condition of the stoma
(α) Contraction wear the plug
(β) Relaxation leave the plug out

(C) **Dressings:** (in gastrostomy)
Protection of surrounding skin by starch, egg albumen, zinc oxide, castor oil, sprinkling of soda bi-carb

(V) POST-OPERATIVE SPECIAL COMPLICATIONS OF GASTRO-DUODENAL SURGERY:

(1) HÆMORRHAGE HÆMATEMESIS

Causes (*a*) *Immediate*
(1) Suture line
(2) Ulcer bed
(*b*) *Late*·
(1) Ulcer bed
(2) Gastro-jejunitis

(3) Gastro-jejunal ulcer
(4) Carcinoma
(5) Retrograde intussusception
(6) Blood, liver, spleen disease

Treat: (A) **Prophylactic:**

(a) **Loosening the clamps after the second row of sutures has been inserted** and waiting for a few moments to see if there is any bleeding point.

(b) **Ligation of gastric vessels in the incision separately**

(B) **Curative:**

(a) **Immediate: Conservative**

(1) **Trendelenburg position**
(2) **Morphia** ¼ gr. repeated
(3) Nothing by mouth ; rectal saline
(4) **Coagulation therapy:**

(α) Calcium gluconate 10 c.cs
: Intravenous every hour
: For three doses.

(β) Coagulen (Ciba)
Hæmoplastin
Sera.

(5) **Drip blood transfusion**

↓ (b) **Gastric lavage:**
: 2% soda-bi carb. in normal saline at 120° F. with adrenaline one drachm

↓ (c) **Operative:**

Ind (1) Failure of conservative treatment
+ (2) Rising pulse rate
+ (3) General signs of hæmorrhage

Tech. (1) Re-exploration
↓ (2) Treatment of focus.
(α) Stoma
(β) Ulcer.

Steps (1) Under running the bleeding point
(2) Over-sewing the entire stoma
(3) Undoing and re-making the stoma
(4) Cauterisation or excision of ulcer

(2) VOMITING:

Causes: (1) **Immediate:** 24–48 hours

(a) Anæsthesia
(b) **Acute dilatation of the stomach**
(c) Œdema of the stoma

(2) **Intermediate:** 7–10 days

(A) **Vicious circle vomiting:**
: Regurgitant vomit

Due to: (*a*) **Abnormal stoma:**
- (1) Situation
- (2) Size
- (3) Direction
- (4) Spur
- (5) Adhesions between walls

(*b*) **Abnormal loop:**
- (1) Length . too short or too long
- (2) Angulation
- (3) Torsion
- (4) Pressure: mesocolic contracture
- (5) Adhesions
- (6) Herniation

(*c*) **Abnormal stomach:** Atony

(B) Peritonitis vomiting
(C) Intestinal obstruction vomiting

(3) **Late:** Months or years after
- (*a*) New ulceration or recurrence of old ulcer
- (*b*) Anastomotic ulcer
- (*c*) Malignancy
- (*d*) Mesocolic contracture
- (*e*) Retrograde intussusception
- (*f*) Adhesions
- (*g*) Intestinal obstruction

Treat (A) **Conservative:** First 36 hours
- (1) Morphia . repeated
- (2) Nothing by mouth
- (3) Rectal: (*a*) Saline with glucose
  - (*b*) Ox bile
  - (*c*) Vomited material
- (4) Injections:
  - (*a*) Intravenous: saline with glucose
  - (*b*) Intramuscular: pitressin 4 hourly

↓ (B) **Gastric aspiration with lavage:**
: After 36 hours
By: Indwelling Ryle's tube

↓ (C) **Operative:** Failure of conservatism
- (1) Vomiting after Billroth I.
  - (*a*) Gastro jejunostomy
  - *or* (*b*) Witzel gastrostomy
- (2) Vomiting after gastro-duodenostomy
  : Gastro-jejunostomy
- (3) Vomiting after Billroth II.
  - (*a*) Witzel gastrostomy
  - (*b*) Treatment of obstruction
  - (*c*) Loop entero-anastomosis
  - (*d*) Indwelling Ryle's tube

(4) **Vomiting after posterior gastro-jejunostomy:**
- (a) **Stomach tube into efferent loop:**
  - (α) Nasal
  - (β) Gastrostomy:
    - Donovan's operation
- (b) Undoing and **re-anastomosis**
- (c) Loop **entero-anastomosis**
- (d) Jejunostomy

(3) HICCOUGH:

Cause. **Diaphragmatic irritation by:**
- (a) Gastric dilatation
- (b) Gastric adhesions
- (c) Basal pleurisy

Treat: (1) Drugs
- (a) Menthol in rect spirit.
  - : Saturated solution
  - : 10 min. every hour
- (b) 1 in 1000 adrenaline:
  - : 10 min. in teaspoonful of water
  - : Every hour
- (c) Hypodermic cocaine 1/10 grain

(2) **CO_2 inhalations**

(4) ANASTOMOTIC ULCER:

Varieties: (1) Gastro jejunal ulcer
(2) Jejunal ulcer

Etio: Males between 30 and 60
Frequency: 2%

Pre-disp: **Gastro-jejunostomy for duodenal ulcer:**

With. (a) **Short history**
+ (b) **Hyper-acidity**
+ (c) **Hyper-mobility**
+ (d) **Rapid emptying**

Path: (1) **Acid factor:**
- (A) **Non-indicated gastro-jejunostomy:**
  - (a) No duodenal ulcer
  - (b) Duodenal ulcer with high acidity
- (B) Entero anastomosis between loops
- (C) **Inefficient post-operative medical treatment**

(2) **Infective factor:**
- : Failure to eradicate septic foci

(3) **Technique factor:**
- (a) Non absorbable sutures on the mucosa
- (b) Clamp trauma
- (c) Faulty stoma

Clinical groups:
- (1) **Recurrence of original syndrome:** 3 to 6 months after operation
- (2) Onset of one of the **complications:**
  - (a) **Perforation:** Acute, subacute, chronic
  - (b) **Hæmorrhage:** Hæmatemesis, melæna
- (3) **X-Ray** evidence
- \+ (4) **Presence of gastro jejunostomy scar**

Diagnosis **Any dyspepsia or acute abdomen with gastro jejunostomy scar**

Diff diag
- (1) Recurrent ulcer
- (2) Duodenal ulcer
- (3) Perforative acute abdomen
- (4) Hæmatemesis causes
- (5) Dyspepsias

Compl (A) **Perforation:**
- (1) **Acute:** Acute spreading peritonitis
- (2) **Subacute:** Perigastric abscess
- (3) **Chronic:**
  - (a) **External:**
    - Palpable mass } supra umbilical
    - ↓ External fistula } supra umbilical
  - (b) **Internal:**
    - Jejuno colic } fistula
    - Gastro colic } fistula
    - Gastro jejuno colic } fistula

(B) **Hæmorrhage.** (a) Hæmatemesis
(b) Melæna

(C) **Adhesions:** Pyloro duodenal obstruction

Treat (1) **Ulcer:**
- (a) **Medical and dietetic:** (See under Peptic Ulcer)
- ↓ (b) Surgical
  - Ind (α) Pain
  - (β) Complications
  - Tech (1) Reconstruction of normal anatomy
    - Ind Un indicated primary operation
  - (2) Partial gastrectomy
    - Hofmeister Finsterer
  - (3) Pyloroplasty or gastro-duodenostomy

(2) Complications
- (A) Acute perforation
  - (a) Closure
  - \+ (b) Peritoneal toilet & drainage
  - \+ (c) Jejunostomy

(B) Gastro jejuno colic fistula
- (a) Restoration of normal anatomy
- (b) Wilkie s two stage operation
- (c) Radical excision
  - (α) Resection of Jejunum, Colon, Stomach
  - (β) Anastomosis of Jejunum, Colon, Gastro jejunostomy

(C) Hæmorrhage medical treatment

(D) Duodenal obstruction duodeno-jejunostomy

) INTESTINAL OBSTRUCTION

Causes (1) Peri stoma adhesions
(2) Mesocolic hernia
(3) Retrograde jejuno-gastric intussusception

Etio More in females
Time Any time after gastro jejunostomy

Clinic (A) Acute Acute on chronic high intestinal obstruction
(B) Chronic Intermittent high intestinal obstruction
(C) X Rays

Treat (1) Reduction and fixation
(2) Resection of anastomosis
(3) Entero anastomosis of loops

) DIARRHŒA

Etio (a) Idiopathic
(b) Achylia
(c) Too rapid emptying
(d) Gastro / Jejuno } colic fistula

Treat (A) Conservative
- (a) Acid hydrochlor dil
  ½ to 1 drachm in a cup of water B D
- (b) Pancreatic extract

(B) Operative
Ind Gastro / Jejuno } colic fistula (See above)

7) FAILURE OF GASTRO JEJUNOSTOMY

Causes
(1) Faulty selection of cases
(2) Un-indicated operation
(3) Faulty pre operative treatment
(4) Technical errors:
- (a) Failure to treat the ulcer directly
- (b) Failure to remove primary septic focus
- (c) Abnormal stoma
  - (α) Ill placed
  - (β) Ill sized

(d) Abnormal loop
(e) Abnormal mesocolic opening
(f) Faulty handling
(g) Faulty clamping
(h) Faulty sutures

(5) **Faulty post operative management**
(a) Neglect of dietetic treatment
(b) Neglect of medical treatment

Moynihan s post gastro enterostomy instructions

(1) Mast cate thoroughly
(2) Avoid condiments raw vegetables hot and irritating foods
(3) **Avoid nicotine and alcohol**
(4) **Take butter cream, milk**
(5) Care of the teeth and gums
(6) Antacids
(7) Test meal every three months

(6) **Post operative complications**

(8) GASTRIC CRIPPLING

Etio (a) **Chronic gastritis**
(b) **Recurrent or anastomotic ulcer**
(c) **Adhesions**

Clin c Belching fullness water brash nausea vomiting

Treat (a) D et with stomachics
(b) Change of environments
(c) Gastric lavage
(d) Diathermy
(e) Abdominal belts

(9) ANÆMIA

Etio **Gastrectomy**

Path Loss of (a) Hydrochloric acid
(b) Stomach principle

Varieties (A) **Hyperchromic microcytic**
Treat Liver and stomach extracts
Iron and other metals
(B) **Pernicious**
Treat Repeated blood transfusions

(10) GASTRIC FISTULA

Etio (1) **Gastrostomy**
(2) Perigastric abscess

Clinic Leakage of acid gastric juice

Compl (a) **Contraction of the gastrostomy opening**
Treat Keep in the tube or plug

(b) **Relaxation** of the gastrostomy opening
Treat Leave out the tube or plug
(c) **Hæmorrhage:**
Treat Gentle insertion of lubricated tube
(d) **Dermatitis:**
Treat Emollient and alkaline dressings
(e) **Accidental premature removal of tube:**
Compl Peritoneal feeding due to misplaced tube
Prophylaxis Gastrostomy feeding by a responsible person

(11) PERITONITIS
Causes (1) **Leakage:**
(a) Gastric contents from stoma
(b) Sepsis from abscess
(c) Peritoneal feeds in gastrostomy
(2) Idiopathic

(12) PAROTITIS (See under Parotid)
Etio Gastro-duodenal operations
Especially gastrostomy

(13) CHEST COMPLICATIONS

(D) IMPORTANT POINTS

Congenital affections:

(1) Hepatico duodenal fold is very important in biliary surgery and has to receive first attention in cholecystectomy
(2) Differential diagnosis between
(a) Hypertrophic pyloric stenosis
(α) Latency of three weeks
(β) No bile in vomit
& (b) Congenital duodenal septum
(α) From birth
(β) Bile in vomit
(3) Differential diagnosis between
(a) Pyloric atresia vomiting from birth
(b) Hypertrophic stenosis vomiting after three week
(4) Suspect congenital pyloric stenosis in
(a) Marasmic child
+ (b) Distended upper abdomen
+ (c) Vomiting a few weeks after birth
(5) The prognosis of hypertrophic stenosis depends on
(a) Time of operation
(b) Pre and post operative care
(6) Meticulous care should be taken in the post operative dieting after Ramstedt operation These children have low food tolerance, obtain breast milk for all patients for first five days.

Gastro-duodenal trauma.

(7) Trauma to gastro-duodenal area has following syndrome
(a) Acute collapse with no external signs
Splanchnic shock
(b) Post traumatic acute abdomen
(α) External wound absent rupture
(β) External wound present penetration

(8) *In a stab wound of the abdomen internal mischief may be out of all proportion to the size of external wound, espe*cially if a long and narrow instrument is used.

(9) The clinical picture and prognosis of stomach injury depend on the following factors
(a) Size of the solution of continuity
(b) Amount of gastric contents at the time
(c) Extent of peritoneal soiling
(d) Time between accident and treatment
(e) Resistance of the patient to shock & sepsis

(10) *Explore every stab wound of the abdomen by open exploration*

(11) Foreign bodies in the stomach can be classified as
(a) Dangerous operative treatment
(α) Perforative
(β) Obstructive
(b) Non-dangerous conservative treatment
(c) Potentially dangerous observative treatment

(12) *Never give a purge for a foreign body in the digestive tract*

(13) Never fail to follow the course of a passing foreign body by repeated X Ray examinations

(14) *Never forget to examine every stool passed within the observative period in cases of foreign bodies*

(15) Chemical opponents and emollients are the right kind of treatment in immediate cases of caustic burns of the stomach

Peptic ulcer

(16) *Greatest enemies of duodenal ulcer patients*
(a) *Tobacco*
(b) *Spicy food*
(c) *Alcohol*

(17) Gastric and duodenal ulcers never arise in a normal mucosa, but are always preceded by inflammatory changes and erosions *the periodicity of symptoms is due to waxing and waning of the associated gastritis*

(18) Causation of chronic peptic ulcer
(a) Local trauma
(α) Mechanical
(β) Circulatory
+ (b) Eroding acid gastric juice.

(19) All peptic ulcers are at first acute and become chronic secondarily due to

(*a*) *Acid factor*
(*b*) Motility factor
(*c*) *Infection factor*
(*d*) Neurogenic factor

(20) *Abdominal triad of Wilkie*

(*a*) *Chronic appendicitis*
(*b*) *Chronic duodenal ulcer*
(*c*) *Chronic cholecystitis*

(21) *Morbid anatomy*.

(*a*) *Chronic ulcer no muscular coat in the base*
(*b*) *Primary carcinoma muscularis present in the base*

(22) In duodenal ulcer, bigger the meal, greater the interval of freedom from pain, but worse the pain after it

(23) *Periodicity of symptoms*

(*a*) Is present in (α) Gastric ulcer
(β) Duodenal ulcer
(γ) Anastomotic ulcer.

(*b*) *Is caused by waxing and waning of associated gastritis.*

(24) Differential diagnosis between angina pectoris and high gastric ulcers which give pain behind the ensiform cartilage, is sometimes difficult

(25) *Main principles of treatment in peptic ulcer*

(*a*) *Elimination of sepsis*
(*b*) *Neutralisation of acidity*
(*c*) *Correction of spasm*
(*d*) *Avoidance of irritation*
(*e*) *Removal or local treatment of ulcer*

(26) *The treatment of peptic ulcer is*
Medico → surgico → medical

(27) *Consider chronic peptic ulcer as essentially a disease for the physician to treat, surgery is for complications only*

(28) Every ulcer patient who has failed to respond satisfactorily to Sippy diet, should be treated with *aluminium hydroxide* before surgical intervention is carried out

(29) Every patient with a peptic ulcer should be under a physician from the time the diagnosis is made to the end of his life whether he was operated on or not.

(30) *The great thing is to feed an ulcer patient,* feed him especially after he has bled or before operation, feed him on a diet of milk, feed him frequently so that stomach is never empty during the waking hours, and if the patient has pain, ask yourself if you could not feed him oftener

(31) Younger men with non stenosing ulcers should be told that if they will abandon alcohol and tobacco, and take frequent meals, they will keep well.

(32) *Sippy's diet* is the best method of treatment for peptic ulcer and hæmatemesis.

(33) *Vitamine C* medication must become the first line of therapy in peptic ulceration

(34) Dangers of antacids (a) Rebound acidity
(b) Alkalosis

(35) *Sodium bi carbonate is the most powerful stimulant of gastric secretions and produces rise in acidity after initial neutralisation*

(36) Bismuth oxycarbonate does not act as an alkali in stomach

(37) Indications for surgery in peptic ulcers
  (1) Failure of prolonged medical treatment
  (2) Perforation
  (3) Hæmorrhage
  (4) Obstruction
  (5) Malignant degeneration.

(38) For duodenal ulcer, operation is only necessary in the presence of complicating factors such as
  (a) Stenosis
  (b) Recurrent hæmorrhage
  (c) Perforation
  (d) Penetration

(39) In gastric ulcers if the medical treatment has failed and especially if the ulcer is deep and adherent, time has come for surgery

(40) Unless a gastric ulcer responds quickly to medical treatment not only by improvement in symptoms but also by reduction in size of the ulcer crater as shown by X-Rays, it ought to be explored

(41) *Chronic gastric and duodenal ulcers are always palpable at operation and should always be demonstrated to the assistant before any treatment is decided upon*

(42) *Operations for peptic ulcer*
  (a) *Simple excision of ulcer*
    (α) Cautery
    (β) Wedge
  (b) *Short circuit*
    (α) Without treatment of ulcer
    (β) With treatment of ulcer
  (c) *Gastrectomy.*
    (α) Wedge resection
    (α) Sleeve resection
    (Γ) *Partial gastrectomy*

(43) *Gastrectomy remains the operation of choice for every gastric ulcer and for duodenal ulcer with (a) high acidity or (b) recurrent severe bleeding* In men past 50, with falling acidity, a gastro enterostomy is seldom followed by recurrent ulceration and is nearly always satisfactory

(44) Partial gastrectomy for peptic ulcer is indicated in
- (a) Suspected malignancy
- (b) Abnormally high acid curve.

(45) Partial gastrectomy is better than gastro jejunostomy for gastric ulcers and duodenal ulcers of recent origin with high acid curve *Gastro jejunostomy is the best operation for duodenal ulcer, provided there is no abnormally high acid curve and rapid emptying and especially if there is pyloric obstruction*

(46) Operations for duodenal ulcer

(1) *Gastro jejunostomy*. With or without excision of ulcer

Ind (α) Elderly patients
(β) Not very high acidity
(γ) Pyloric stenosis
(δ) Immobile duodenum

(2) *Gastro duodenostomy*

Ind (a) Lean, anxious patients
(b) Hyperchlorhydria
(c) No pyloric stenosis
(d) Mobile duodenum

(3) *Partial gastrectomy*

Ind (a) Young patients
(b) Hyperchlorhydria
(c) Stenosis or no stenosis
(d) Immobile duodenum

Tech (A) Fundusectomy
Removal of a large wedge from the mid stomach
(B) Resection of ulcer and pyloric ring
Judd's partial duodeno gastrectomy
(C) Resection for exclusion Finsterer RzA
(a) Removal of 2/3rds of stomach
\+ (b) Spur formation

(47) In duodenal ulcers, gastro jejunostomy alone gives 80% of satisfactory results, in gastric ulcers pyloric exclusion and direct treatment of the ulcer must be added on to the gastro jejunostomy, gastrectomy being the best operation for them

Perforations:

(48) *Slow pulse found during the period of first eight hours after perforation is a sign of great diagnostic value*

(49) Differential diagnosis
(a) Perforated ulcer
(b) 'Dry' perforated ulcer
(c) 'Pseudo' perforated ulcer

(50) Perigastric abscess is nearly always due to gastric or duodenal perforation

(51) Prognosis in gastro duodenal perforations
(a) Condition of the stomach at the time of perforation
(b) Size of the perforation
(c) Amount of extravasation
(d) Time between perforation and treatment

(52) *Operation under 6 hours saves nearly all delayed operation saves few There is no condition except hæmorrhage, in which it is more important for every one concerned to move quickly*

(53) Important guides to the site of a perforation after the laparotomy
(a) Particular spot from which fluid wells up
(b) Follow the direction of increasing inflammation

(54) As far as possible avoid narrowing of the lumen at the site of sutured perforation if unavoidable, do gastro jejunostomy in addition to suture

(55) Remember that in gastro-duodenal perforations
(a) Peritoneal toilet is not very necessary
(b) *Keep suprapubic drain in all late cases*
(c) Additional right flank tube in all duod perforations (may be omitted in early cases)

(56) Causes of post operative death in perforation
(a) Within 48 hours Shock
(b) Within one week Peritonitis
Pneumonia
(c) Third week Pylephlebitis
Subphrenic abscess.

(57) *Amount of extravasation is a more important factor than time in the prognosis of gastro-duodenal perforations, and higher the pulse rate, worse the prognosis*

Hæmatemesis.

(58) *The most common causes of hæmatemesis*
(a) *Œsophageal varices in cirrhosis liver*
(b) Gastrostaxis young women
(c) Chronic gastric ulcer or carcinoma elderly men

(59) Gastric ulcer is three times as common as duodenal ulcer as a cause of severe hæmatemesis

(60) *Days of starvation treatment of hæmatemesis are over Patient is put on full diet with plenty of animal protein and iron*

(61) First step in dealing with severe hæmorrhage from peptic ulcers is to start medical treatment, followed by drip blood transfusion

(62) *In every case in which bleeding is sufficient to raise the pulse to 100 and reduce the hæmoglobin to 50%, a blood drip transfusion should be started and the patient removed to an hospital, operate when hæmoglobin percentage has mounted to 60% with blood drip transfusion still running*

(63) For first hæmorrhage in the presence of known and proved gastro duodenal ulcer

(*a*) Match the blood
(*b*) Drip transfusion
if (α) Pulse more than 100
(β) Hæmoglobin less than 50%
(*c*) Operation
when (α) Hæmoglobin 90%
\+ (β) Drip transfusion going in
\+ (ϒ) Ulcer with a long history

(64) Operation for hæmatemesis from peptic ulcer, gives good results if done on the first or second day

(65) Treatment of grades of hæmatemesis

(1) Grave Medical + blood drip
(2) Severe (*a*) Medical + blood drip
↓ (*b*) Operative life saving
If condition allows
(3) Moderate (*a*) Medical
↓ (*b*) Operative for ulcer
In quiescent period
(4) Trivial Operative for ulcer
As soon as possible

(66) In operation for hæmorrhage from peptic ulcers, we should remember that we are not operating on a chronic peptic ulcer but to save the life from bleeding to death

(67) Under no circumstances, advise operation in gastrostaxis

(68) *Do blood transfusion in every case of severe hæmatemesis*

(69) Massive hæmatemesis

(*a*) Blood transfusion
↓ (*b*) Medical and dietetic treatment
↓ (*c*) Blood drip transfusion.

(70) When, operating for bleeding peptic ulcer no obvious lesion in the stomach or duodenum is found examine

(*a*) Posterior wall of the duodenum
(*b*) Liver
(*c*) Appendix through a separate incision
(*d*) Meckel s diverticulum through appendix incision

Gastro-duodenal obstruction :

(71) Superior mesenteric arterial pressure is a sequela of prolapsed cæcum and an etiology of
- (a) Acute gastro duodenal ileus
- (b) Chronic duodenal ileus
- (c) Post operative vicious circle vomiting
- (d) Peptic ulcer

(72) *Splashing three hours after a meal Gastric dilatation*

(73) *Delay in the emptying of the stomach is only to be diagnosed after 6 hours stasis*

(74) *A glass of milk with about a dozen raisins at night, stomach wash next morning any residue denotes pyloric obstruction*

(75) Slowly progressing or stationary obstruction is due to fibrosis, rapidly progressing obstruction is due to malignancy

(76) *Avoid soda bi-carb in all cases with pronounced vomiting, either as medication or lavage lotion, to ward off alkalosis*

(77) *Do not fail to do blood urea tests in every case of pyloric stenosis*

(78) *Do not forget to give gastric lavage before any operation on the stomach, where chronic gastric dilatation is present, it is an advantage to keep the tube in for gastric aspiration during the operation* if necessary, otherwise following may result
- (a) Respiratory obstruction
- (b) Aspiration pneumonia
- (c) Peritoneal extravasation

(79) *Do not give isotonic glucose infusion in high grade pyloric stenosis,* due to danger of hypochloræmia with coma and tetany

Ulcer-cancer :

(80) *Ulcers on the greater curvature should always be considered malignant, also all ulcers more than an inch in diameter*

(81) Risk of carcinoma in gastric ulcer is not great but is greater than the risk of operation.

(82) Gastric ulcer starting after 45, is probably malignant even if it runs a slow course over years

(83) In gastric ulcer, there is always the lurking shadow that it may be malignant in duodenal ulcer the fear is absent

Gastric Carcinoma :

(84) Carcinoma stomach is an invariable sequela of chronic gastritis.

(85) Ulcerative carcinoma is the most malignant and deposits early in glands and liver, gland involvement is least in
- (a) Fungoid type
- (b) Leather bottle stomach
- (c) Carcinoma at (α) Anterior wall
  - (β) Greater curvature
  - (γ) Fundus

(86) Enlarged glands in carcinoma stomach are not always carcinomatous, they may be inflammatory, especially in ulcerative primary and so do not necessarily contra indicate operation

(87) *Chief symptoms in carcinoma stomach*
- (1) Short, continuous, dyspeptic *anorexia*
- (2) Dull *continuous pain* or discomfort
- (3) *Anæmia* with loss of weight
- (4) History
  - (a) Long history of peptic ulcer with a recent change in the classical syndrome
  - (b) *Short history in a middle aged patient*

(88) Sudden onset of dyspepsia not reacting to three weeks medical treatment after the age of 40 suspect carcinoma do test meal, if hypo or achlorhydria explore

(89) Rapidly developing signs of pyloric obstruction in a patient past middle age ? Carcinoma pylorus

(90) *Dyspepsia starting after the age of 45 must always be regarded with grave suspicion*

(91) Though there is no characteristic early symptomatology of gastric carcinoma there is nearly always
- (a) Dyspepsia
- (b) Anorexia
- (c) Pain or discomfort

(92) Symptomatology of gastric carcinoma
Pain → fullness → weakness → indigestion → anorexia → vomiting → loss of weight
Special symptoms
- (a) Dysphagia
- (b) Hæmatemesis.

(93) *It is far more important to ascertain the cause of a chronic dyspepsia in a middle aged person than to treat it Alkalies—for chronic dyspepsias of middle aged people — are the best friends of the undertaker*

(94) *In every case of suspected carcinoma of the stomach*
Examine
- (a) *Liver*
- (b) *Peritoneum* (α) Fluid
  - (β) Multiple nodules
- (c) *Supraclavicular glands*
- (d) *P R or P V*

(95) *Rectal and supraclavicular examinations are very important in gastric carcinoma*

(96) Negative X-Ray does not exclude malignancy, if other clinical signs are present.

(97) Gastric test meal is more important in primary gastric *carcinoma, than in carcinoma secondary to gastric ulcer.*

(98) Common laboratory signs of gastric carcinoma:
(a) Achlorhydria
(b) Occult blood in stools

(99) In every case of gastric carcinoma, exploration should be undertaken, except where irremovable metastatic growths can be demonstrated pre operatively or where the general condition of the patient disallows such a step.

(100) *To wait till cancer of the stomach is proved by clinical course is to lose most of the cases If the symptoms are not better in two months, explore.*

(101) *Recent dyspepsia (not amenable to one month's medical treatment) + Achlorhydria + Middle age · Exploratory laparotomy.*

(102) If resection cannot be performed in pyloric cancer, exclusion (by cutting stomach across, joining the proximal portion to jejunum, and closing the distal portion) is better than simple gastro jejunostomy

(103) Fungating growths give better end results than ulcerating or infiltrating Enlarged lymph glands should not necessarily *contra indicate operation*

Gastro duodenal fistulæ:

(104) Most common cause of internal duodenal fistula is . *Gall stone.*

(105) Most common causes of external duodenal fistula are
(a) Perforated duodenal ulcer
(b) Cholecystectomy with *duodenal trauma.*

(106)

Variety	*Reaction*	*Position*	*Treatment*
Gastric	Acid .	Left .	Alkaline dressings
Duodenal ..	Alkaline	Right	Acid dressings

(107) *Complications* of gastro duodenal fistulæ.
Irritation and digestive ulceration of skin

X-Rays:

(108) Delay in emptying of the stomach is to be diagnosed only after 6 hours' stasis.

(109) Duodenal ulcer:

(a) Large stomach of normal contour

\+ (b) Hyper motility

\+ (c) Six hours' stasis

(110) X Ray evidence of peptic ulcer or carcinoma

(a) Direct persistent deformity *in more than one plate*

(b) Indirect. abnormal motility, size, retention

(111) *Never diagnose a barium deformity on a single X Ray plate*

Gastro duodenal operations:

(112) *Operative treatment is indicated if even after one month's strict medical and dietetic treatment, occult blood persists in gastric contents and fæces*

(113) *No stomach operation should be done within 4–6 weeks of extraction of teeth*

(114) Give dilute hydrochloric acid a week before the operation in all achlorhydric cases Continue it in post operative period in (a) Total gastrectomy

(b) Gastrectomy anæmia

(c) Achlorhydria.

(115) *Never forget pre operative stomach wash and aspiration in every case of alimentary obstruction, acute or chronic*

(116) *In every case of peptic ulcer explore in addition*

(a) *Biliary apparatus*

(b) *Pancreas*

(c) *Appendix* may be removed as routine

(117) In exploratory laparotomy for gastro duodenal ulcers, do not forget the association of gastric and duodenal ulcers

(118) Most important point in gastro duodenal or intestinal anastomosis is to avoid angulations, torsions, long loops, tensions and adhesions

Gastro jejunostomy:

(119) *Gastro jejunostomy is a most satisfactory operation only for pyloric obstruction* If used for non obstructed duodenal ulcer in a case of high acidity and rapid emptying, it is likely to heal the duodenal ulcer with temporary relief of pain at the cost of a subsequent gastro jejunal ulcer

(120) A mechanically efficient gastro enterostomy causes the disappearance of a duodenal ulcer but may lead to the formation of an anastomotic ulcer An inefficient operation fails to cure the duodenal ulcer and in addition, causes an anastomotic ulcer

(121) Contra indications for gastro jejunostomy

(a) Clinical (α) Short history
+ (β) Hyper acidity
+ (γ) Hyper motility
+ (δ) Hyper evacuation

(b) Operative Failure to demonstrate the ulcer

(122) *Never do a gastro enterostomy in the absence of a demonstrable organic lesion*

(123) Gastro jejunostomy 'resume'

Ind (a) Failure of medical treatment
(b) Appearance of complications
Pyloric obstruction

Tech Posterior
No loop
Iso peristaltic

Site Stomach
(a) Most dependant part as the patient stands
or (b) *On a line with the right margin of cardia*
Jejunum 4–6 inches from the flexure

Direction (a) *Vertical* curvature to curvature
(b) Oblique
(c) Transverse *if the stomach is small*

Approximation Through the mesocolon avascular region

Application Proximal jejunum to lesser curvature

Sutures (a) Anchor sutures
(b) Sero muscular posterior
(c) All coats posterior
(d) All coats anterior
(e) Sero muscular anterior
(f) Gastro mesocolic

Material 0–00 chromicised catgut on eyeless round bodied needle

Method Sero muscular and all coats sutures begin and end at opposite corners

Points Do not forget to
(a) Pack off
(b) Not to excise any muc mem
(c) Loosen the clamps and look for hæmorrhage after the completion of all coats suture and *before putting in the anterior sero muscular* suture
(d) Remove the packs and count before closure

(124) *Common causes of failure after gastro jejunostomy*

(a) *Non indicated operation*
(α) No organic lesion very bad
(β) Organic lesions without obstruction

(b) *Neglect of post operative medical and dietetic treatment*
(c) *Failure to eradicate chronic septic focus*

(125) Common complications of gastro jejunostomy
(a) Hæmatemesis
(b) Vicious circle vomit
(c) Gastro jejunal or jejunal ulcer
(d) Failure of operation

(126) *Never fail to give medical and dietetic instructions to patients after gastro jejunostomies and to do their test meals every three months for about two years*

(127) *Do not forget that gastro jejunostomy is a step in the medico surgico medical treatment of the peptic ulcer* and is not the sole cure for it It is bound to be a failure or perhaps a source of danger if careful post operative regime is not instituted

Gastro duodenostomy:

(128) Indications
(a) Gastro jejunostomy contra indicated
(α) Probability of anastomotic ulcer
(β) Gastro ptosis
(b) Duodenum and pylorus mobilisable
(c) No peri duodenal adhesions
(d) No active ulcer

Gastrectomy

(129) Partial gastrectomy in peptic ulcer is indicated in
(a) Suspected malignancy
(b) Abnormally high acid curve

(130) Extent of the operation
(1) Gastro duodenal ulceration
Leave the pyloric antrum behind
(2) Carcinoma
Remove at least $\frac{3}{4}$" of the duodenum

(131) Different techniques
(A) *Billroth I End to end gastro duodenostomy*
(1) Classical
(2) Schoemaker
(α) Excision and reconstruction of lesser curvature
(β) End to end anastomosis
(3) Kocher
(α) Closure of gastric stoma
(β) Anastomosis of duodenal stoma to posterior gastric wall
(4) Haberer Finney end to side gastro duodenostomy
(5) Horsley Flaring open the duodenal stoma to enlarge the gastro duodenal junction

(B) *Billroth II*
- (*a*) Closure of duodenal stump
- (*b*) Closure of gastric stoma
- (*c*) *Side to side gastro-jejunostomy*
  - (α) Anterior
  - (β) Posterior Mikulicz

(C) *Polya*
- (*a*) Closure of duodenal stump
- (*b*) *End to side gastro-jejunostomy*
  - (1) Classical
  - (2) Mikulicz
    - (α) Closure of duodenal stump
    - (β) Closure of gastric stoma
    - (Υ) Posterior side to side anastomosis
- (1) *Anterior Polya*
  - (*a*) Balfour
    - (α) Long loop
    - (β) Iso peristaltic
    - (Υ) Entero anastomosis between loops
  - (*b*) *Moynihan*
    - (α) No loop
    - (β) Retro-peristaltic
  - (*c*) Kronlein
    - (α) Horizontal
    - (β) Iso peristaltic
- (2) *Posterior Polya*
  - (*a*) Classical
    - (α) Long loop
    - (β) Iso-peristaltic
  - (*b*) *Finsterer*
    - (α) Long loop
    - (β) Iso peristaltic
    - (Υ) Spur formation
  - (*c*) Reversed loop
    - (α) No loop
    - (β) Retro peristaltic
  - (*d*) Lahey
    - Transposition of proximal loop above the mesocolon

(D) Roux Y
- (α) Division of jejunum across
- (β) End to side gastro jejunostomy
- (Υ) End to side jejuno-jejunostomy

(132) Difference in two techniques
- (*a*) Iso peristaltic
  - (α) Long loop
  - (β) Proximal jejunum at lesser curvature

(b) Retro peristaltic
(α) No loop
(β) Proximal jejunum at greater curvature

(133) Finsterer R zur A resection for exclusion
(a) Removal of ⅔rds of distal stomach
(b) Posterior iso peristaltic end to side gastro jejunostomy
(c) Spur formation

(134) Greater omentum in gastrectomy
(a) Ulcer operations
(α) Preserve
(β) Do not deprive of the blood supply
(b) Cancer operation
Remove.

(135) Amount of stomach removed is an important etiological factor in post gastrectomy anæmia

Gastrostomy ·

(136) Special complications
(1) Leakage peritonitis
(a) Never leave the care of the feeding tube to an inexperienced nurse within the first five days
(b) Always inquire whether the tube was inadvertently drawn out during the first five days
(2) External leakage with skin irritation
Emollient and alkaline skin dressings
(3) Abnormal stoma
(a) Contracture keep in the tube
(b) Relaxation leave out the tube
(4) Tube blockage
(a) Clean after every feed by pouring saline or water
(b) Syringe in
(c) Withdraw if too much insertion

(137) Never defer the gastrostomy till the patient is moribund

Post operative treatment

(138) Take special care of the following after gastro duodenal operations
(a) Oral cavity
(b) Lungs.

(139) *It is a good practice to leave in a stomach tube for 24 hours after a gastric operation*
For (a) *Aspiration*
(b) Lavage
(c) Feeding

Post-operative complications

(140) *Keep a vomit chart after gastric operations* It is after 48 hours if vomiting commences or large quantities of bile

are recovered by gastric aspirations, that a serious view of the case must be taken.

If vomiting persists and all the fluids given by the mouth can be recovered by a tube it is necessary to operate again usually between the tenth and twentieth days.

(142) *Post operative acute dilatation of the stomach usually comes on within first 48 hours of operation*

(143) Post operative hæmatemesis

(A) Post gastro jejunostomy

(*a*) Whilst a most conservative attitude should always be adopted towards re opening the abdomen, there should be no such attitude towards blood transfusion

(*b*) Curious post operative peritonitis supervenes on about the fifth day after the second operation

(*c*) If bleeding continues inspite of blood transfusion, operation must be resorted to

(B) Post gastrectomy

(*a*) Re operation is absolutely contra indicated

(*b*) Blood transfusion is the only hope.

(144) Peritonitis is the cause of death in 70% of fatal cases after gastrectomy and in 30% after gastro jejunostomy

(145) *The one tragedy in peptic ulcer surgery is the appearance of anastomotic or jejunal ulcer after gastro jejunostomy*, which has an incidence of 2%, it occurs in hyper acid and hyper motile stomachs with recent symptoms and in those cases where post operative medical and dietetic treatment is neglected

(146) Gastro duodenostomy is to be preferred to gastro jejunostomy in patients with high acidity

(147) Anastomotic ulcer etiology

(*a*) Acid factor *hyperchlorhydria*

(*b*) Infective factor *persistent septic focus*

(*c*) Technical factor *operative trauma*

(*d*) Negligence factor *post operative inefficient regime*

(148) Best permanent results for gastro-jejunal ulcers follow gastrectomy by Finsterer method

(149) If hæmorrhage has followed gastro jejunostomy anastomosis should be undone even if nothing can be palpated after exploration laparotomy

(150) Acute retrograde gastro jejural intussusception

(A) Acute intestinal obstruction

(*a*) High obstruction

(*b*) Visible peristalsis left to right

(*c*) Epigastric scar

(*d*) Mobile mid abdominal tumour

(B) Hæmatemesis after gastro jejunostomy
(C) Recurrent vomiting after gastro-jejunostomy.

(151) *Failures of gastric surgery are due to too great a l opening the abdomen:*
(a) Before a full trial is given to medicine
(b) Before full investigations are made
(c) Before full pre operative regime is over.

(152) Usual causes of failures after gastric surgery:
(a) Too patent stoma
(b) Vicious circle vomit
(c) Peri anastomotic gastritis.
(d) Persistence of original ulcer
(e) Anastomotic ulcer
(f) Gastrectomy anæmia.

General:

(153) *The common gastro duodenal emergencies are*
(1) *Perforation:*
  (a) *Stab wound*
  (b) Foreign body
  (c) *Peptic ulcer*
  (d) Carcinoma
(2) *Acute hæmatemesis:*
  (a) Cirrhosis liver
  (b) Gastric: (α) *Ulcer*
    (β) *Carcinoma*
    (γ) Gastrostaxis
  (c) Duodenal. ulcer
(3) *Foreign bodies*
(4) *Acute dilatation of the stomach*
(5) Acute phlegmonous gastritis
(6) Perigastric abscess.

(154) 'Resume' of gastro duodenal treatment:
(A) Gastric ulcer:
  (a) Excision + gastro enterostomy
  (b) *Gastrectomy*
(B) Duodenal ulcer:
  (a) *Gastro jejunostomy:*
    (α) Simple
    (β) With excision of ulcer
  (b) Gastro duodenostomy
  (c) Gastrectomy.
    (α) Judd
    (β) *Finsterer R z A*
(C) Gastric carcinoma:
  : Radical gastrectomy
(D) Gastro duodenal perforation:
  (a) *Simple suture*

(b) Suture + gastro jejunostomy
(c) Partial gastrectomy

(E) Hæmatemesis
(a) *Local treatment* only ligature, cautery, excision
(b) Gastro enterostomy
(α) Simple
(β) With local treatment
(c) *Partial gastrectomy*
(d) Finsterer R z A

(F) Pyloric obstruction
(a) *Gastro jejunostomy*
(b) Gastro-duodenostomy

(G) Hourglass stomach
(a) *Partial gastrectomy*
(b) Gastro gastrostomy
(c) Gastro plasty

(H) Gastro-jejunal ulcer
(a) Undo gastro jejunostomy
+ (b) Pyloroplasty
or (b) Gastro-duodenostomy
or (b) *Subtotal gastrectomy*

Miscellaneous

(155) *Normal quantity of gastric juice is from 1.5 to 3 litres a day, 50 ounces of milk will neutralise 1 5 litres*

(156) Simple hyperchlorhydria does not lead to duodenal ulcer necessarily and is compatible with perfect health.

(157) *Pain which awakens a patient from sleep is always organic.*

(158) Causes of hunger pain
(a) Duodenal ulcer
(b) Hyperchlorhydria
(c) Excessive nicotine
(d) Carcinoma stomach
(e) Chronic appendicitis
(f) Cholecystitis
(g) Transverse colitis
(h) Neurasthenia.

(159) Epigastric pain and dyspepsia in the obese
Do not forget small epigastric ventral hernia.

(160) Bouts of vomiting unassociated with abdominal pain are not due to gastric disease

(161) Tumours of the stomach have transmitted pulsations from the aorta and also move with respirations.

(162) *In every case requiring an operation, get the permission for it before the administration of pre-operative morphia*

CHAPTER V

THE INTESTINES

(I) CONGENITAL MALFORMATIONS:

(1) EXOMPHALOS

Def Persistence of extruded midgut in the umbilical cord, with non closure of abdominal parietes

Varieties. (1) Complete
(2) Partial

Path Congenital umbilical hernia: Covered by amnion

Clinic Hernia at the umbilicus containing intestines

Treat (a) *Return of the contents into abdomen*
↓ (b) Repair of the umbilical defect

(2) DERANGEMENTS OF ROTATION

(A) Non rotation (a) Small intestines on right side
(b) Proximal colon on left side

(B) Reversed rotation

Etio Return of proximal colon before jejunum

Path Transverse colon is deep to mesentery

Clinic Acute low intestinal obstruction
(Personal case age about 40)

(C) Mal rotation Misplaced intestinal parts

(D) Volvulus neonatorum

Def Volvulus of mobile midgut

Path (a) Axial rotation of midgut and mesentery
↓ (b) Acute kinking of third part of duodenum

Clinic Acute high intestinal obstruction in infants

Treat Explore → untwist → cæcopexy

(3) *INCOMPLETE DESCENT OF CÆCUM AND APPENDIX*

Site Under the liver

Clinic Appendicitis in children simulates cholecystitis

Treat No McBurney incision in a child

(4) CONGENITAL INTESTINAL DIVERTICULÆ

(A) Duodenal (See under Duodenum)

(B) Ileal

(a) Acquired Multiple mesenteric

(b) Congenital Meckel's diverticulum

Def Persisting intra abdominal part of vitelline duct

Site Umbilicus to anti mesenteric border of ileum,
: **Within two feet from ilio cæcal valve**

Etio *2% of cases*

Varieties: (1) Umbilical fæcal fistula
(2) **Umbilical sinus**
(3) Entero cystoma: a cyst
(4) **Ileal diverticulum:**
(*a*) Vermiform
(*b*) Tubular
(*c*) Spherical
(5) Fibrous band: terminal ligament

Clinical syndrome. (*a*) Pseudo appendicitis
(*b*) Intestinal obstruction
(*c*) Intussusception
(*d*) Melæna in children

Complication (1) **Diverticulitis** → perforation → peritonitis
(2) **Intestinal obstruction:**
(*a*) Volvulus
(*b*) Kink
(*c*) Band
(*d*) Knot
(*e*) Intussusception
(*f*) Associated stricture
(3) **Hernia:** Littre's hernia
(4) Ulceration Peptic, T.B, Typhoid, etc.

Treat: (1) Exploration
↓ (2) **Amputation** of the diverticulum:
With (A) Purse string closure:
Compl. (α) Stricture ileum
(β) Persistent diverticulum
or (B) **Transverse closure**
or (2) **Excision:** of (*a*) Diverticulum
+ (*b*) Parent part of ileum
With: End to end anastomosis

(C) Colonic Diverticulosis

(5) INTESTINAL ATRESIA

Def (*a*) Atresia Solid cord with no lumen
(*b*) *Stenosis Narrowed lumen*
Due to failure of expansion of the wall

Sites (1) Duodenum ampullary part
(2) Ileum lower end
(3) Transverse colon *left half*
(4) Flexures
(5) Recto-sigmoid junction

Degrees (*a*) Stenosis
(*b*) Septum
(*c*) Atresia
(*d*) Absent segment

Etio. Congenital error in development

Clinic Acute intestinal obstruction
Vomiting + constipation + distension
Sign (a) Visible peristalsis if the site is lower
(b) Barium enema
Treat (1) Immediate exploration
↓ (2) Proximal *stomy* ileum cæcum colon
Ind (a) Bad condition
(b) Atresia of the colon
or (3) Anastomosis short circuit

(6) MEGACOLON HIRSCHSPRUNG
Def hypertrophy and dilatation of the left colon
Due to (a) Local segmental neuro-muscular inco-ordination
(b) Achalasia pelvi rectal Pelvic & sigmoid colon
(c) Achalasia internal anal sphincter rectum
(d) Kinking due to lengthening + mobility
Etio Boys infants or adolescents
Clinic (1) Obstinate constipation
(2) Enormous dilatation of colon
(3) General chronic toxæmia
Sign X Rays barium enema
Compl (1) Colitis
(2) Ulceration -> perforation -> peritonitis
(3) Auto intoxication
Treat (A) Conservative
(a) Enemata + bowel training + liquid paraffin
(b) Dilatation of pelvi rectal junction sphincter
(B) Operative
(1) Sympathectomy
(If barium enema is evacuated under spinal)
(a) Lumbar ganglionectomy
(b) Presacral nerve + Inf mes plexus.
(2) Colon plication Niclas
Union of anterior and lateral tæniæ over the whole length of large intest from the cæcum to the rectum.

(7) MICRO-COLON
Def Atresia of the whole or parts of the intestinal tract
Path Solid cords about the thickness of goose-quill
Clinic Acute Intestinal obstruction in the new born
(a) Pronounced vomiting
(b) No distension
(Personal case Whole of small intestine from 2nd part of duodenum to ileocæcal junction resembling coils of a round worm).

(8) ENTERO-PTOSIS
Def Lower position and sagging of the intra abdominal viscera, associated with hypotonia, organic impediments and neurasthenia

Etio: (1) Virginal: congenital
(2) Maternal: weakness of abdominal wall
Clinic: (a) Neurasthenia and hypochondria
(b) Nervous dyspepsia influenced by posture
(c) Diathesis: lean, kyphotic
(d) Prominent lower abdomen
(e) X Rays barium meal
(α) Abnormal position: ptosis
(β) Hypotonia
(γ) Stasis
Associated: (A) **Bands:** (a) Cystico duodenal band:
. Gall bladder to pylorus
(b) Pringle's mesocolic band:
Mesocolon to duod jej flexure
(c) Lane's first kink
. Ilio cæcal valve to ovary
(B) **Membranes:**
(a) Jackson's membrane:
Over cæcum and asc. colon
(b) Payr's membrane:
Over splenic flexure
(c) Toldt's membrane.
. Over pelvic colon
(C) **Mesenteries:** (a) Cæcum
(b) Ascending colon
(c) Descending colon
(D) **Kinks**
(E) **Abnormal mobility:**
(a) Torsions
(b) Volvulus
(Γ) **Sliding hernia:** Hernia en glissade
(G) **Intestinal stasis:** Hypotonia
Treat. (1) Conservative massage, supports, tonics
(2) Operative pexies cæcopexy, nephropexy.

(9) CONSTIPATION OF CHILDHOOD

Path (a) *Normal colon*
(b) Anatomical anomaly undescended cæcum
(c) Distended colon
(d) Kinks
(e) Elongated loop of colon
(f) Megacolon. sympathectomy
Treat Conservative Surgery not indicated

(II) TRAUMA TO THE INTESTINES:

(1) SUBCUTANEOUS TRAUMA

(A) **Contusion:** Associated or unassociated with abdominal wall contusion

(B) **Crushing**
(C) **Tearing**
(D) **Bursting**: (*a*) Closed loop
(*b*) Muscle strain: inguinal hernia
(*c*) Compressed air: colon

Path: (*a*) Intraperitoneal intestines with mesentery
(*b*) Extraperitoneal: intestines without mesentery

Clinic: *Of subcutaneous intestinal trauma*
(1) History of injury
(2) Shock
↓ (3) Peritonitis: pain + tenderness + rigidity
(*a*) Local
(*b*) General

Compl: (*a*) Peritonitis
(*b*) Retro peritonitis

Treat: **Exploration** and repair

(2) STAB WOUND:

Clinic. (*a*) Wound in the parietes: small or large
↓ (*b*) Signs of perforation

Treat: (1) **Immediate exploration in every case:**
Ind **Every stab wound of the abdomen**
↓ (2) **Search** for the lesion or lesions
↓ (3) **Suture**: At right angles to long axis
↓ (4) Peritoneal toilet
↓ (5) Drainage. if required

(3) GUNSHOT WOUND:

Clinic: (1) History
(2) Wounds of entry and exit
(3) Perforative peritonitis + hæmo peritoneum

Treat: (1) Exploratory laparotomy
↓ (2) Exploration of all organs
↓ (3) Suture of all foci + removal of the shots
↓ (4) Peritoneal toilet
↓ (5) Drainage

(4) FOREIGN BODIES:

Sites: (*a*) Duodeno jejunal flexure; (*b*) Lower ileum

Clinic: (1) History or no history
(2) Intestinal colic with vomiting
(3) Enteritis

Compl: (*a*) Acute intestinal obstruction
(*b*) Ulceration → perforation → (*a*) Abscess
(*b*) Peritonitis
↓ (*c*) Stricture: chronic intestinal obstruction

Treat (1) **Observative**
(a) Do not give purgative
(b) Give bulky food + lubricants
(c) Examine every stool
(d) X Ray daily

↓ (2) **Operative** Exploration
Ind (a) Dangerous objects
(b) Onset of acute complication
(c) Stasis for more than a week

(III) SEPTIC INFLAMMATIONS OF THE INTESTINES

(A) SMALL INTESTINES

(1) REGIONAL ILEITIS

Syn *Ile tis terminalis (Regional entero-colitis)*
Crohn s disease

Def Granulomatous cicatrising inflammation with ulceration of terminal 8"–12" of ileum

Path Theory **Lymph block**
Low grade infection
Morb anat (a) Inflamed bowel wall
(b) Œdema of the mesentery
(c) Enlarged lymph nodes

Clinic (1) Stage one
Pseudo subacute **appendicitis**
(2) Stage two
Colitis Diarrhœa with blood & mucus
(3) Stage three
Subacute or chronic **intest obstruction**
(4) Stage four
Abscesses and **fistulæ**

Signs Palpable mass on abdominal or rectal exam

Special (1) X Rays **string sign of Kantor**
(2) Occult blood in stools

Diff diag (a) **Chronic appendicitis**
(b) Meckel s diverticulitis
(c) **Tuberculous intestines**
(d) Malignancy

Treat (1) **Resection**
(2) Artificial anus
(3) Short circuit ileo transverso stomy

(2) POST OBSTRUCTIVE ENTERITIS

(A) Constipation alternating with diarrhœa
In chronic or subacute intest. obstruction

(B) Post-operative diarrhœa with temperature
In acute intest. obstruction

(B) LARGE INTESTINES:

(1) ULCERATIVE COLITIS:

Def: Chronic inveterate ulcerative inflammation of the colon

Clinic: (1) Recurrent colicky attacks
(2) Diarrhœa with mucus and pus
(3) Tender, firm colon
(4) General chronic toxæmia

Sign: (*a*) **X-Rays**: (α) Lead pipe appearance
(β) Loss of haustration
(*b*) Stools: microscopic and cultural
(*c*) **Sigmoidoscopy**:
(α) Mucosal hyperæmia
(β) Œdematous thickening
(γ) Miliary abscesses
(δ) Tiny multiple ulcers

Diff. diag: Any other cause of colitis: **dysentery**

Compl: (1) Perforation:
Treat: Suture + cæco or ileostomy
(2) Pseudo polyposis
(3) Strictures
(4) Peri colitis

Treat: (A) **Conservative**: Medical and dietetic
(*a*) High vitamin, high calorie, low residue diet
(*b*) Bowel washes and bland instillations
(*c*) Specific sera
(*d*) Eradication of septic foci

(B) **Operative**: If failure of conservatism
(1) Fulminating: ileostomy
(2) Moderate:
(*a*) Appendicostomy
(*b*) Cæcostomy
(*c*) **Ileostomy**
(*d*) Colostomy: well above
(3) Inveterate
: **Multi-staged colectomy**:
Tech: (A) Paul-Mikulicz partial
(B) Abdomino perineal resection
(C) Subtotal colectomy:
(*a*) Ileostomy
↓ (*b*) Colectomy upto sigmoid:
: After six weeks
↓ (*c*) Abdomino perineal:
: Few months later

(C) Post operative:
: Keep the stomy for at least six months after subsidence of all symptoms

(2) REGIONAL COLITIS:
Def: Localised inflammatory swelling of the colon
Path: (a) Hypertrophy of the wall
(b) Ulceration of the mucosa
Clinic. (a) Diarrhœa
(b) Palpable mass
Diff. diag (1) T B
(2) Malignancy
Compl: Intestinal obstruction or fistula
Treat. Resection

(3) DIVERTICULOSIS AND DIVERTICULITIS:
Def: Mucosal herniæ through the muscular coats, between the mesocolic and anti mesenteric longitudinal bands, along the entries of blood vessels or in appendices epiploicæ
Etio. Elderly obese males with chronic constipation
Cause: Pulsion + stasis. caused by constipation
Site: Sigmoid colon
Clinic. (A) **Inflammatory syndrome**: Perforation
(a) Left sided appendicitis
(b) Left iliac abscess
(c) Pelvic or general peritonitis
(B) **Obstructive syndrome**: Fibrosis
: Chronic or acute on chronic
: Due to adhesions, kinking, volvulus
(C) **Carcinomatous syndrome**: Hyperplasia
: Hyperplastic diverticulitis
: Signs of carcinoma coli
(D) **Fistulous syndrome**: Secondary infection
(a) External: fæcal fistula
(b) Internal: vesico or vagino-colic
(E) **Latent syndrome**: 5% cases over 45 years
: Diverticulosis: X-Ray appearances
Signs: X-Ray. **barium enema**
(1) Serrated margin of colon
(2) Round spots outside the colonic lumen:
: After evacuation of the enema
Treat: (1) **Conservative**: Dietetic, laxatives, irrigations
↓ (2) **Operative**: Two stage
(A) Transverse **colostomy** or cæcostomy
↓ (B) **Resection** with anastomosis
or (C) Treatment of complications

(IV) SPECIFIC DISEASES OF THE INTESTINES:

(1) INTESTINAL TUBERCULOSIS:
(A) **Miliary tuberculosis**:
(a) Ascitis
(b) Acute peritonitis } : with miliary tubercles all over the serous coat

(B) **Tuberculous ulceration :**

Etio : Milk or ingested sputum

Site : Lower ileum

Morb anat. **Multiple** tuberculous ulcers.

: **At right angles to long axis**

Clinic : (a) Colicky pain with diarrhœa
(b) Doughy abdomen
(c) Tuberculous diathesis

Compl : (a) Chronic → acute **intestinal obstruction :**
(α) Multiple strictures
(β) Adhesions
(γ) Kinks
(b) **Peritonitis :** Local or general
(α) Plastic
(β) Perforative
(c) **Fistulæ :** External or internal
: Adhesion → perforation → abscess ← fistula
(d) **Acute miliary tuberculosis :**
(α) Ascitis
(β) Peritonitis

Treat : (A) **Conservative :** Anti tuberculous
(B) **Operative :**
(a) Resection if local
(b) Ileo colostomy . short circuit
: **Go above the highest stricture**

(C) **Hyperplastic ileo-cæcal tuberculosis :**

Def : Chronic tuberculous hyperplastic inflammation of the cæcum and pericæcal tissues with ulcers, strictures, adhesions and polyposis

Etio : Males (? females) between 20 and 40 ·
: Mohamedans

Path · Ileo cæcal hyperplasia, fibrosis and ulceration

Clinic . (a) Chronic intestinal obstruction
\+ (b) Irregular, tender mass in rt. iliac fossa

Sign : (1) Barium enema · filling defect
(2) Barium meal · stasis
: (Rapid emptying in early stages)

Diff diag : (a) **Carcinoma cæcum**
(b) **Chronic appendicitis**
(c) Regional ileitis
(d) Diverticulitis
(e) Actinomycosis

Compl (1) **Acute intestinal obstruction**
(2) Fæcal fistula
(3) Perforation → peritonitis
(4) *Generalised tuberculous peritonitis*

Treat (*a*) Short circuit **Ileo transverse colostomy**
Ind (α) Obstruction
(β) Abscess
(γ) Fistula
↓ (*b*) Resection (in one or two stages)

(D) Generalised tuberculosis of the colon

Clinic Chronic blood stained diarrhœa

Diff diag (*a*) **Dysenteries**
(*b*) **Ulcerative colitis**
(*c*) Diverticulitis
(*d*) Malignancy

Treat *General anti tuberculous*

(2) INTESTINAL TYPHOID

(A) Typhoid tympanitis and enteritis

Clinic (1) Diarrhœa
(2) Tympanitis } in the 2nd or 3rd week
(3) Distension

Diff diag (*a*) Typhoid perforation
(*b*) Acute abdomen

Treat Medical

(B) Typhoid hæmorrhage

Clinic (*a*) *Shock + pallor*
↓ (*b*) Copious tarry stools

Diff diag Other causes of intestinal hæmorrhage
(1) Intestinal purpura
(2) Acute intussusception
(3) Mesenteric thrombosis

Treat Repeated blood transfusions

(C) Typhoid perforation

Clinic (1) *Sudden subnormal temp + shock*
(2) Local tenderness
(3) Perforative peritonitis **rigidity absent**

Time About the 3rd week but may be the 1st week

Site Lower ileum

Diff diag (1) Typhoid tympanitis and enteritis
(2) Other causes of acute abdomen
(3) Toxæmias

Treat (1) Exploratory laparotomy •
Under local anæsth
↓ (2) Explore the lower ileum

↓ (3) Suture the perforation
↓ (4) **Look for and treat other perforations**
↓ (5) Peritoneal toilet + drainage
↓ (6) Closure

Pre and post treat: (a) Blood transfusions
(b) Anti shock treatment.

(3) DYSENTERY:

Etio: Entamœba histolytica

Path: Undermined, irregular, worm eaten ulcers:
: In the descending and pelvic colon

Clinic: Blood with mucus in the stools

Sign: Amœbic **ova in the stools**

Compl: (1) **Hepatitis** or hepatic abscess
(2) Stricture
(3) Local abscess. (a) Intra peritoneal
(b) Extra peritoneal

Treat: (a) **Emetine:** gr. one subcut. for ten days
(b) Colonic irrigations. Pot. permanganate

(4) ACTINOMYCOSIS:

Site: Cæcum · right iliac fossa

Clinic · (a) Persistent sinus after appendicectomy
(b) Right iliac. irregular tumour + multiple sinuses + sulphur granules
(c) Actinomycotic pyæmia

Diff diag: (1) **T. B. Cæcum**
(2) **Carcinoma cæcum**
(3) Chronic appendicitis
(4) Regional ileitis
(5) Diverticulitis

Compl: Actinomycotic liver

Treat. (a) Pot. iodide; sulphonamide
(b) Scraping, excision
(c) X Rays

(V) INTESTINAL ULCERATION:

(A) *Small intestine*:

(1) PEPTIC ULCER.

Sites: (a)· Anastomotic
(b) **Jejunal**
(c) Meckel's diverticulum

Clinic: (1) Ulcer symptoms
(2) Melæna or occult blood in stools

(2) TUBERCULOUS ULCER:

Site: **Ileum**

Morb anat **Transverse**; undermined; multiple
Studded with tubercles

Clinic: (a) Diarrhœa
(b) Chronic intestinal obstruction

Compl Stricture (See above)

(3) TYPHOID ULCER

Site **Lower ileum**: Within 3' of ileo-cæcal valve

Morb anat **Longitudinal**; acutely inflamed,
Ulcerated **Payr's patch**

Compl (1) **Perforation**
(2) **Hæmorrhage**

(B) *Large intestines*

(1) ULCERATIVE COLITIS

Site **Any part** of the colon

Morb anat Variable sized, raised, irregular ulcers
With œdematous inflamed muc. mem

Clinic (See above)

Compl (a) Perforation
(b) Pericolitis
(c) Pseudo polyposis
(d) Stricture

Treat (See above)

(2) DYSENTERIC ULCERS

Sites **Pelvic and descending colon**

Morb anat Multiple undermined, irregular, **worm eaten**

Clinic (See above)

Compl Stricture (See above)

Treat (See above)

(3) STERCORAL ULCER

Sites Rectum pelvic colon, cæcum

Morb anat Patchy erosions of the muc mem
Due to *pressure of fæcoliths*

Clinic Proctitis or colitis syndrome

Compl Perforation → (a) Pericolitis → fistulæ
(b) Peritonitis

(4) MALIGNANT ULCER

Site *Anatomical or physiological stasis*
(a) **Rectum**
(b) **Sigmoid**
(c) Splenic or hepatic flexure
(d) **Cæcum**

Morb anat Friable, indurated, everted, infiltrating

Clinic (See under Malignant Growths)

Compl Chronic → acute intestinal obstruction

Treat: (a) Radical excision
(b) Palliative: (α) Proximal drainage
(β) Short circuit

(VI) STRICTURES OF THE INTESTINE:

(A) CONGENITAL ATRESIA OR STENOSIS:
(1) Duodenum
(2) **Meckel's diverticulum**
(3) Junction of mid and hind gut: (in transverse colon)

(B) TRAUMATIC:
(1) Rupture
(2) **Anastomosis**: Post operative

(C) INFLAMMATORY:
(1) **Perforation**
(2) **Strangulation**

(D) ULCERATIVE:
(1) **T. B. intestines**: Multiple strictures
(2) Regional enteritis or colitis
(3) **Dysenteric**
(4) Ulcerative colitis
(5) Diverticulitis
(6) Typhoid
(7) **Malignancy**

(E) NEW GROWTHS **Carcinoma**

Clinic: *Of intestinal stricture*
(1) Chronic intestinal obstruction
(2) Barium meal or enema

Compl: Acute on chronic intestinal obstruction

Treat. (1) Resection and anastomosis:
: One stage or two stage
(2) **Short circuit**
(3) Artificial anus

(VII) INTESTINAL OR FAECAL FISTULAE:

Def. An abnormal track leading from the intestinal lumen either to the surface of the body or to the lumen of another portion of the gut or any other viscera and conveying intestinal contents.

Varieties: (A) **Artificial**: Therapeutic
(1) **External**: Entero or colo stomy
(a) **Permanent**: Spur
(b) **Temporary**: No spur
(α) Urgent: life saving
(β) Preliminary: two stage resection
(2) **Internal**: Short circuit
(a) **Permanent**: Palliative
(b) **Temporary**: Preliminary to resection

(B) **Natural** Pathological
- (1) **External** Faecal fistula
- (2) **Internal**
  - (a) Entero enteral
  - (b) Entero visceral
    - (α) Bladder
    - (β) Vagina

Etio (1) **Congenital**
- (a) Patent Meckel
- (b) Rectal malformations

(2) **Traumatic**
- (a) Accidental wounds
- (b) Operative tuberculosis
  - acute sepsis
  - malignancy

(3) **Inflammatory**
- (a) **Appendicitis**
- (b) Peptic ulcer
- (c) Strangulated hernia
- (d) **T B intestines**
- (e) Diverticulitis
- (f) Regional ileitis
- (g) Actinomycosis

(4) **Malignant Carcinoma**

(5) **Operative** (See under Entero and Colostomies)

Path *Factors in keeping up the stoma*

(1) **Spur**
- (a) A kink with opening at apex
- (b) Excluded loop with lateral opening
- (c) Excised loop with two openings
- (d) Upper limb stoma + lower limb closure

(2) **Distal obstruction**
- (a) **Growth**
- (b) Infection
- (c) Fibrosis

(3) **Nature of the etiology**
- (a) **Tuberculosis**
- (b) **Carcinoma**
- (c) Actinomycosis

(4) **Irritative discharges**
- (a) Pancreatico-biliary
- (b) Jejuno ileal
- (c) Urine
- (d) Pus

Diagnosis: (1) **Diagnosis of the fistula:**

- : Passage of intestinal contents:
  - (*a*) Digestive ferments
  - (*b*) Stercoraceous or stercorous material
  - (*c*) Odour:
    - (α) Fæcal odour does not mean fæcal fistula
    - (β) Fæcal fistula does not mean fæcal odour

(2) **Diagnosis of the level:**

- (*a*) Position
- (*b*) Physical characters:
  - (α) Consistency
  - (β) Odour
  - (γ) Colour
- (*c*) Condition of the stoma and surroundings

Levels:
- (α) High enteric: jejunal
- (β) Low enteric. ileal
- (γ) Colonic: colon

(3) **Diagnosis of the etiology:**

- (*a*) History
- (*b*) Clinical examination
- (*c*) Laboratory examination

Compl:
- (1) **Irritative inflammation** of the surroundings
- (2) Cellulitis or gangrene
- (3) Inanition cachexia: in high fistulæ

Treat: (A) **Conservative:**

Ind:
- (1) Temporary fistulæ with **no spur**
- (2) **Absence of distal obstruction**
- (3) Low position
- (4) Stoma lined by granulations
- (5) Small stoma
- (6) **Acute stage**

Tech:
- (*a*) Constipating low residue **diet**
- (*b*) Medicines: **Bismuth cum opio**
- (*c*) **Dressings:** Protective
- (*d*) **Irrigations:** Of the limbs
- (*e*) General or specific therapy
- (*f*) Mechanical methods
  - (α) Beck's paste or chewing gum
  - (β) Button or plaque closure
  - (γ) Love's obturator method

(B) **Operative:**

Ind:
- (1) Fistulæ with **spur**
- (2) **Presence of distal obstruction**
- (3) [illegible] fistulæ
- (4) [illegible]
- (5) Failure of conservatism

Contraind Irremovable distal obstruction:
(a) Which cannot be short circuited
(b) Where too much bowel has to be short circuited

Tech (1) **Enterotome** application to the spur:
Ind Artificial anus
Time Six to eight weeks after
(2) **Lateral purse-string** closure
(3) Lateral suture
Linear, transverse to the axis
(4) **Extra-peritoneal resection** and closure
(5) ***Intra peritoneal resection*** *and closure*
(6) **Complete resection** and closure
(7) **Intestinal exclusion:**
(a) Partial bilateral
(b) **Complete:** (α) Unilateral
(β) ***Bilateral***

(VIII) NEW GROWTHS OF THE INTESTINES:

(A) TUMOURS OF THE SMALL INTESTINE

(a) *Innocent*

(1) Adenoma
Etio: Children
Path Single or multiple
Clinic Colicky pain
Sign Barium meal
Compl (a) Intussusception
(b) Malignancy
Treat Excision
(2) Papilloma
(3) Lipoma
(4) Fibroma

(b) *Malignant*

(1) Carcinoma
Site Jejunum → ileum
Clinic (1) Intermittent partial obstruction
(2) Progressive anaemia and cachexia
(3) Occult blood in the stools
(4) X Rays normal stomach and colon
Treat Resection
(2) Sarcoma

(B) TUMOURS OF THE COLON:

(1) *Innocent*.

POLYPOSIS OF THE COLON.

Etio: **Hereditary and familial**
Age: Younger with each generation under 40

Path: (A) Single·
- (*a*) Pedunculated adenoma
- (*b*) Villous papilloma

(B) **Diffuse** papillomatosis or **adenomatosis**

Clinic: (1) Signs of severe colitis:
- (*a*) Pain
- (*b*) Bleeding
- (*c*) Diarrhœa

(2) Debility
(3) History

Signs: (*a*) Barium enema
(*b*) Sigmoidoscopy

Diff. diag: Pseudo polyposis of ulcerative colitis

Compl: (1) Intussusception
(2) **Malignancy**

Treat: (A) **Resection:**
- (*a*) Local growth
- (*b*) Local segment

(B) **Diathermy:** In low polyposis
. Through the sigmoidoscope

Post. treat: Re examine every four months

(2) *Malignant:*

: CARCINOMA COLON·

Etio· (*a*) Men between 50 and 70
(*b*) **Young age in:** (α) **Cæcum**
(β) **Sigmoid**
(γ) **Polyposis**

Sites: (1) **Rectum**
> (2) **Sigmoid**
> (3) Cæcum
> (4) Hepatic flexure
> (5) Splenic flexure

Path: **Columnar celled adeno carcinoma:**
- (*a*) **Annular** stricture.
  : **Most malignant**
- (*b*) **Tubular** stricture
- (*c*) **Ulcerative**
- (*d*) **Formative:**
  · Encephaloid
  · **Cauliflower** } **: Least malignant**
- (*e*) **Infiltrating**
- (*f*) **Colloid**

Spread: (A) *Local:*
- (*a*) Round the lumen. stenosis
- (*b*) Pericolic: adhesions

(B) *Lymphatic:*
: Epicolic → paracolic → intermediate → para aortic → receptaculum chyli → thoracic duct → left supra-claviculars

(C) *Blood stream:*
: Liver

(D) *Trans cœlomic:*
(*a*) Malignant peritonitis
(*b*) Krukenberg tumours
(*c*) Pouch of Douglas

Clinic: (*a*) **Age:**
(α) Between 50 and 70
(β) Young adults. sigmoid
(Personal case. Plump, young English lady about 20)

(*b*) **Chronic intestinal obstruction:**
(α) 'Dyspepsia'
(β) Altered bowel habit.
(1) Constipation
(2) Diarrhœa

(*c*) **Colitis:** Blood and mucus per anum

(*d*) **Tumour:**
(α) Local: palpable or sigmoidoscopy
(β) Metastatic

(*e*) **Cachexia** and anæmia
: Sometimes absent, especially in the young (see above)

Signs: (1) **Stools:** Blood or growth pieces or cells
(2) **Barium:** Enema or meal
· Filling defect
(3) **Sigmoidoscopy**

Clinical syndrome: (A) Right colon carcinoma:
(*a*) Appendicular syndrome
(*b*) T. B cæcum syndrome
(*c*) Colitis syndrome
(*d*) Metabolic disease syndrome

(B) Left colon carcinoma:
(*a*) Chronic or acute obstructive
(*b*) Ulcerative: Colitis
(*c*) Formative: tumour

Diagnosis: (1) **Slightest change in bowel habit**
(2) **Any obscure loss of health:**
: Pass in the sigmoidoscope
: Do barium enema

Diff. diag : (1) Inflammations of the intestines
(2) Obstructions of the intestines
(3) Intra abdominal tumours
(4) General diseases : anæmia
: diabetes

Compl : (1) Acute or chronic intestinal obstruction
(2) Perforation → (a) Peritonitis
(b) Retro peritonitis
(c) Fæcal fistula :
(α) External
(β) Internal
(3) Intussusception

Treat : **Operation :**
Ind : (a) Presence of **complications**
(b) **Operability**
(c) **Palliative :** In inoperable growths

Inoperable : (1) Local . adhesions, bad place
(2) Regional : irremovable basal glands
(3) Distant : liver, peritoneum, pelvis
: supraclaviculars
(4) General : cachexia

(I) *Carcinoma with complete obstruction :*
: Only treat the obstruction and do no more
(A) *Expectant :* Acetyl choline
↓ Small enemata
↓ (B) *Surgical drainage :*
(a) **Cæcostomy :** Blind
Ind : Urgent life saving
(b) **Proximal colostomy :**
Ind : (α) Local distension
(β) Irremovable growth

(II) *Carcinoma with partial obstruction :*
(1) *Partial obstruction with operable growth :*
(A) *Two stage :*
(a) **Relieve the obstruction .**
(α) At or below the hepatic flexure :
· Cæcostomy
(β) Cæcum or ascending colon :
: Ileo transversostomy
↓ (b) **Radical removal :** 'With anastomosis
(B) *Three stage . Paul Mikulicz*
(a) **Exteriorisation** of the growth
↓ (b) **Excision** of the growth
↓ (c) **Restoration of continuity of lumen**
(2) *Partial obstruction with inoperable growth :*
(A) *Permanent artificial anus'*

(B) *Lymphatic*
- Epicolic → paracolic → intermediate → para aortic → receptaculum chyli → thoracic duct → left supra claviculars

(C) *Blood stream*
Liver

(D) *Trans cœlomic*
(a) Malignant peritonitis
(b) Krukenberg tumours
(c) Pouch of Douglas

Clinic (a) **Age**.
(α) Between 50 and 70
(β) Young adults sigmoid
(Personal case Plump, young English lady about 20)

(b) **Chronic intestinal obstruction**·
(α) 'Dyspepsia'
(β) Altered bowel habit
(1) Constipation
(2) Diarrhœa

(c) **Colitis**· Blood and mucus per anum

(d) **Tumour**·
(α) Local palpable or sigmoidoscopy
(β) Metastatic

(e) **Cachexia** and anæmia
Sometimes absent especially in the young (see above)

Signs (1) **Stools**: Blood or growth pieces or cells
(2) **Barium**: Enema or meal
Filling defect
(3) **Sigmoidoscopy**

Clinical syndrome (A) Right colon carcinoma
(a) Appendicular syndrome
(b) T B cæcum syndrome
(c) Colitis syndrome
(d) Metabolic disease syndrome

(B) Left colon carcinoma
(a) Chronic or acute obstructive
(b) Ulcerative Colitis
(c) Formative tumour

Diagnosis. (1) **Slightest change in bowel habit**
(2) **Any obscure loss of health:**
. Pass in the sigmoidoscope
: Do barium enema

(B) *Short circuit:*
- (a) Cæcal or ileocæcal growth:
  : Ileo transversostomy
- (b) Hepatic flexure growth:
  - (α) Cæco sigmoidostomy
  - (β) Ileo sigmoidostomy
- (c) Transverse colon or splenic flexure growth
  - (α) Permanent proximal colostomy
  - (β) Colo colostomy local short circuit
  - (γ) Ileo sigmoidostomy + cæcostomy

(III) *Carcinoma with no obstruction:*
- (1) *No obstruction with operable growth:*
  Radical operation.
  - (a) Resection of:
    - (1) Adequate amount of growth
    - (2) Healthy segment above and below
    - (3) Segments with precarious blood supply
    - (4) Corresponding mesentery
    - (5) Complete lymph area
  - ↓ (b) **Restoration of intestinal lumen**
- (2) *No obstruction with inoperable growth*
  - (a) *Short circuit* in higher growths
  - (b) *Permanent colostomy.* lower left colon

(A) *Tumours of right colon*
- (1) Inoperable Ileo transversostomy
- (2) Operable (a) Ileo-transversostomy
  ↓ (b) Resection

(B) *Tumours of the left colon*
- (1) *With acute obstruction.*
  - (a) Inoperable growth
    - (α) Proximal permanent colostomy
    - or (β) Cæcostomy
      ↓ Short circuit
  - (b) Operable growth
    Cæcostomy
    ↓ Resection
- (2) *With no obstruction*
  - (a) Inoperable growth
    - (α) Cæcostomy
      ↓ Short circuit
    - (β) Proximal permanent colostomy
  - (b) Operable growth
    Multi-staged operation
    - (α) Exploration → cæcostomy
    - ↓ (β) Resection → anastomosis
    - or (γ) Paul Mikulicz

(IX) SPECIAL AFFECTIONS OF THE INTESTINES:

(1) Cystic pneumatosis
Site Small intestine
Morb anat Clusters of gas containing cysts
(2) Melanosis coli
Def Grey to black pigmentation of the colon
Etio Constipation
With anthracene laxative habit
Site Ileo-cæcal valve to anal canal
Path Melanin in the large mononuclear cells of the muc mem
Clinic (a) Obstinate constipation
(b) Anthracene purgatives
(c) S gmoidoscopy
Treat (1) Un irritating diet
(2) Leave off the anthracene purges
(3) Liquid paraffin

(X) INTESTINAL OBSTRUCTION

Path types (1) **Simple obstruction**
Blockage of lumen at one point
(2) **Closed loop obstruction**
Blockage of lumen at two points
+ Imprisonment of intervening loop contents
(3) **Strangulation**
(a) Obstruction of (a) *Lumen*
+ (b) *Circulation*
+ (c) Nerve conduction
↓ (b) Endangered viability of affected segment
(4) **Adynamic or paralytic ileus**
Nervous inhibition leading to paralysis of the intestinal peristalsis due to
(a) Intestinal exhaustion
(b) Nervous lesions
(c) Toxæmias
Clinical types (1) **Acute**
(2) **Chronic**
(3) **Acute on chronic**
Situation types (a) **High small gut**
(b) **Low small gut**
(c) **Large gut**
Classification Of types and causes of intestinal obstruction
(A) *Simple obstruction Blocked lumen*
(1) High small gut
Causes (a) **Acute dilatation of the stomach**
(b) Congenital pyloric stenosis
(c) **Foreign bodies**

(d) Spasm
(e) Post-operative jejunal obstruction

(2) **Low small gut:**

Causes: (a) **Adhesions:** (α) Post inflammatory
(β) Post operative
(γ) Post traumatic
(b) **Stricture**
(c) Foreign bodies
(d) Gall stones
(e) Spasm
(f) **Paralytic ileus**

(3) **Large gut:**

Causes (a) **Carcinoma:** 70%
(b) Diverticulitis: 10%
(c) Fæcal impaction: 10%
(d) Stricture
(e) Congenital atresia
(f) Spasm
(g) Hirschsprung

(B) *Closed loop obstruction:*
(a) Obstructed hernia
(b) Volvulus

(C) *Strangulation:*

(1) **Internal strangulation:**

Causes. (a) **Bands:** (α) Peritoneal
(β) *Omental*
(γ) Visceral
(b) Orifices:
(α) Internal hernia
(β) Holes in omenta and mesenteries
(c) **Volvulus:** (α) Small gut
(β) Sigmoid
(γ) Cæcum
(d) Intussusception. (α) Primary
(β) Secondary
(e) Infarction: (α) Embolism
(β) *Thrombosis*
(γ) Trauma

(2) **External strangulation:**

Causes: ***Hernia:*** (a) **Inguinal**
(b) **Femoral**
(c) **Umbilical**
(d) Others

Path. causes: (1) **Pressure on bowel from outside:**
(a) **External hernia**
(b) **Bands and adhesions**

(c) Internal hernia
(d) Glandular or tumour pressure
(2) **Diseases of the bowel wall:**
(a) **Intussusception**
(b) **Volvulus**
(c) Kink
(d) **Stricture:**
(1) Traumatic
(2) Perforation
(3) Hernial
(4) **Tuberculous**
(5) Dysenteric
(6) **Malignant**
(e) **Growths:** Carcinoma
(f) **Paralysis**
(3) **Lumen obstructions:**
(a) Gall stones
(b) **Fæcal impaction**
(c) Foreign bodies
(d) **Worms:** Ileus verminosis

Pathology: (A) **General toxæmia:** Theories
(a) Proteose toxins
(b) Bacterial toxins. B Welchii
(c) Dehydration loss of fluids
(d) Alkalosis loss of chlorides
(e) Circulatory failure
(f) Azotæmia
. Retention of nitrogenous products
(g) Rise in serum potassium
(B) **General shock:** Peritonism
(C) **Local changes:**
(a) Obstruction
↓ (b) Congestion
↓ (c) Strangulation
↓ (d) Paralysis
or (e) Perforation
or (f) Gangrene
↓ (g) Peritonitis

Morb anat: (A) **Simple obstruction:**
(1) Proximal distension
(2) Local stenosis
(3) Distal contraction
↓ (B) **Strangulation:**
(1) Rapid distension: CO_2
(2) Vascular obstruction:
(a) Congestion → bleeding:
(α) Lumen
(β) Peritoneal

↓ (b) Infarction
↓ (c) Gangrene
(3) Nervous obstruction ' ileus

+ (C) **Changes outside the bowel:**
(1) Exudate
(a) Serous
(b) Hæmorrhage strangulation
(c) Purulent infection
(2) Lung complications vomit aspiration
(3) Dehydration
(4) Toxæmia

Morb physio (A) **Simple obstruction:**
(1) *High small gut*
(a) **Dehydration**
(b) Blood changes
(α) Fall in chlorides
sodium
bicarbonates
(β) Anhydræmia
(γ) Alkalosis
(c) Renal failure anuria → uræmia
(2) *Low small gut*
(a) Proximal distension fluids + gases
↓ (α) **Toxic absorption**
(β) Nervous shock **peritonism**
(b) Sudden decompression
↓ { (α) Toxic absorption
(β) Splanchnic stagnation
(γ) Mesenteric shock }
↓ Collapse and death
(3) *Large gut*
Gradual culmination of chronic obstruction

Strangulation:
(1) **Necrosis:**
↓ (a) Perforation
or (b) Gangrene
↓ (c) Peritonitis
(2) **Shock** ·
(a) Initial traumatic mesenteric
↓ (b) Latent instability of B P
↓ (c) Terminal (α) Loss of blood
(β) Nervous
(γ) Toxic
(3) **Bacterial toxæmia:**
(a) Peritonitis
(b) Long loop
(c) Long time

Syndrome: (1) *Symptomatic syndrome:*

(A) **Acute (primary):**

: Obstructive acute abdomen:

(1) Shock
(2) Vomiting
(3) *Absolute constipation*
(4) *Colicky pains*
(5) Tympanitis

(B) **Acute (secondary to chronic):**

: Obstructive chronic → acute abdomen:

(1) Signs of (A)
\+ (2) *Visible peristalsis*

(C) **Chronic:**

(1) Constipation with diarrhœa
(2) Intermittent colic with vomiting
(3) *Visible ladder pattern peristalsis*

(2) *Situation syndrome*

(A) **High small gut:**

(1) *Sudden and rapid course*
(2) Shock + +
(3) *Vomiting early and* + +
(4) *Rapid dehydration*
(5) Absolute constipation. —
(6) Distension: —

(B) **Low small gut:**

(1) *Colicky pains.* + +
(2) Vomiting after a time and +
(3) *Absolute constipation*
(4) Central distension
(5) Ladder pattern:
. If acute on chronic

(C) **Large gut:**

(1) Slow course
(2) *Shock:* —
(3) *Vomiting late and* —
(4) *Absolute constipation:* + +
(5) Distension early and + +:
(a) Ballooned rectum
(b) Distended cæcum
(6) P.R.

(3) *Degree syndrome:*

(A) **Simple obstruction:**

(1) Gradual onset
(2) Shock: —
(3) Slow course

(B) **Strangulation:**
- (1) Sudden onset
- (2) Shock. + +
- (3) Rapid course
- (4) Tender and rigid abdomen.

(4) *Causative syndrome* ·

(A) **Mechanical:**
- (a) Presence of an etiology
- (b) *Colicky pains*
- (c) *Borborygmi audible*
- (d) Visible peristalsis if chronic

(B) **Paralytic:**
- (a) Presence of an etiology
  - (α) Hæmatoma.
    Splanchnic or mesenteric
  - (β) Operative or accidental trauma
  - (γ) Strangulation bowel
  - (δ) Late peritonitis
- (b) *Absence of pain*
- (c) *Dead silence on auscultation*
- (d) *Rapid and pronounced distension*
- (e) Reaction to
  - (α) Spinal anæsthesia
  - (β) Hypertonic saline
  - (γ) Acetyl-choline

Diff diag (1) **Any other cause of acute abdomen:**
- (a) Traumatic
- (b) Inflammatory
- (c) Perforative

(2) **Referred abdomen:**
Pseudo acute abdomen

(3) **Medical abdomen:**
- (a) Colics
- (b) Typhoid
- (c) Abdominal influenza
- (d) *Purpura*

(4) **Toxic abdomen:**
- (a) Uræmia
- (b) Diabetic coma

Causes *Of obstruction at various ages*

(A) **Acute obstruction:**
- (a) *Congenital*
  - (1) **Imperforate anus**
  - (2) Congenital occlusion of the ileum
  - (3) Congenital duodenal occlusion
  - (4) Hypertrophic pyloric stenosis

(5) **Volvulus neonatorum:**
. Personal case volvulus neonat
+ mesenteric cyst
(6) **Exomphalos**
(7) Strangulated umbilical hernia

(b) *Infants.*
(1) **Congenital rectal abnormalities**
(2) Strangulated external hernia
(3) **Intussusception**
(4) Internal hernia

(c) *Children*
(1) **Intussusception**
(2) **Meckel's diverticulum**
(3) Bands and adhesions
(4) Strangulated external hernia
(5) Internal hernia

(d) *Adults.*
(1) **Strangulated external hernia**
(2) **Volvulus:** Small intestines
(3) **Bands** and apertures
(4) Internal hernias
(5) Gall stone or fæcal impaction
(6) Pressure of tumours
(7) **Intussusception**

(e) *Seniles*
(1) **Carcinoma**
(2) **Strangulated external hernia**
(3) **Volvulus:** Colon
(4) Intussusception
(5) **Fæcal incarceration**

(B) **Chronic obstruction:**

(a) *Children*·
(1) **Adhesions:**
Tuberculous or peritonitic
(2) Tuberculous intestines
(3) ~~Tabes mesenterica~~
(4) **Chronic intussusception**
(5) Hirschsprung

(b) *Adults*·
(1) **Peritoneal adhesions**
(2) **Cicatricial stricture**
(3) Carcinoma
(4) **Ileo-cæcal tuberculosis**
(5) Extrinsic tumour pressure

(c) *Seniles*·
(1) **Carcinoma**
(2) **Fæcal impaction**

- (3) Chronic intussusception
- (4) Diverticulitis
- (5) Extrinsic tumour pressure

(C) Acute-on chronic obstruction:
- (1) Block to the lumen
- (2) Kink or adhesions
- (3) Paralysis
- (4) Chronic local foci:
  - (a) T. B cæcum
  - (b) Carcinoma cæcum or colon
  - (c) Diverticulitis

Treatment Of intestinal obstruction

(1) *Degree treatment*

(A) *Simple intestinal obstruction*
- (1) **Anti shock treatment:** 2 to 3 hours
  - (a) Warmth
  - (b) Morphia
  - (c) Continuous intravenous saline
- \+ (2) **Gastric and duodenal suction drain:** Ryle's tube

(B) *Strangulation*
- (1) **Anti shock treatment**
- ↓ (2) **Exploration:**
  - (a) Invagination if limited
  - (b) Resection + anastomosis condition good
  - (c) Exteriorisation + drainage condition bad

(C) *Paralytic ileus*
- (1) Continuous **gastro duodenal suction drain**
- (2) **Morphia:** Small and repeated doses
- (3) Continuous **intravenous saline drip:** 4 pints a day for 3 days

(2) *Site treatment*

(A) *High small gut obstruction*
- (1) **Replacement of fluids and plasma salts:**
  - (a) Intravenous (α) Hartmann's solution
    - (β) *Glucose saline*
  - (b) Subcutaneous saline
- (2) **Gastro duodenal suction: siphonage drain**
- (3) Balance the fluid lost and taken

(B) *Low small gut obstruction*
- (1) **Conservative:**
  - (a) Gastro duodenal suction drain
  - (b) Intravenous and subcutaneous saline
- ↓ (2) **Operative:**
  - (a) Very urgent: blind enterostomy (if no strangulation)

(b) Urgent: proximal enterostomy
(c) **Non-urgent: Radical**

(C) *Large gut obstruction:*

(1) **Conservative:**
(a) Withhold oral food and fluids
(b) Gastro-duodenal suction drain
(c) Intravenous glucose saline
(d) Repeated rectal tube or enemata

↓ (2) **Blind:** (a) **Cæcostomy**
or (b) **Transversostomy:**
: Wangensteen

Ind: Failure of conservatism for 48 hours

↓ (3) **Radical operation:**

Ind: After subsidence of acute attack

(3) *Clinical syndrome treatment:*

(A) *Acute intestinal obstruction:*

(1) **Urgent exploratory laparotomy:**

Pre oper. (a) Two enemata
(b) Duodenal suction
(c) Intravenous: *saline,* glucose, blood
(d) Anti gas gangrene serum

Tech: *Palpate the cæcum:*
(a) *Cæcum distended:*
: *Cæcostomy only*
(b) *Cæcum collapsed:*
: *Explore for the etiology:*
(α) Distension + +:
: Proximal enterostomy
(β) Cause found and removable:
: Radical
(γ) Gangrene present:
(1) Primary resection
or (2) Exteriorisation
↓ Secondary resection

(2) **Planned laparotomy:** After diagnosis

Tech: (a) Find out the cause
(b) Radical treatment
(c) Proximal drainage: if necessary

(B) *Acute on chronic intestinal obstruction:*

(a) Condition bad: (α) Cæcostomy
(β) Proximal **enterostomy**
(γ) Proximal colostomy

(b) Condition good:
(1) Removable: (α) **Excision**
↓ (β) Drainage

(2) Irremovable:
  (α) Permanent colostomy
  or (β) **Short circuit** + drain

(C) *Chronic intestinal obstruction:*
  (1) Removable:
    (a) Primary excision + anastomosis
    (b) Short circuit
    ↓ **Excision**
  (2) Irremovable: (a) **Short circuit**
    or (b) Permanent colostomy
  (See under Intestinal Operations also)

CAUSES OF INTESTINAL OBSTRUCTION:

(1) CONGENITAL CAUSES:
  : Intestinal obstruction in the new-born
  : (See under Congenital Malformations)

Causes: (A) *Direct: Mal-development itself*
  Path. (a) **Bands**
    (b) **Septa:** (α) Partial
      (β) Complete
    (c) **Atresia:** (α) Partial
      (β) Complete
    (d) **Absence of a segment**
  Sites: (1) **Duodenum:**
    Clinic: (a) Vomiting from birth
      (b) Bile in the vomit
    Treat: (1) Bailey's spigot method
      (2) Gastro enterostomy
    (2) **Ileum:**
    Clinic: Low small gut obstruction:
      (a) Vomiting
      (b) Visible peristalsis
      (c) Distension
    Treat: (1) Bailey's spigot method
      (2) Ileo-colostomy
    (3) **Rectum:** (See under Rectum)
  (B) *Indirect: Effects of the mal-development:*
    (a) **Exomphalos:** (α) Complete
      (β) Partial
      : Leads to obstructed umbilical hernia
    (b) **Mal-rotation or deranged rotation:**
      : Leads to:
        (α) Volvulus neonatorum
        (β) Reversed rotation obstruction

(c) **Meckel's diverticulum :**
: Leads to (1) Stricture
(2) Band
(3) Kink
(4) Intussusception
(5) Volvulus

(d) **Megacolon :**
: Leads to neuro muscular obstruction

(2) ·INTUSSUSCEPTION.

Def: Invagination of a part of the intestine into the lumen of adjoining segment due to irregular peristalsis

Etio: (a) **Infantile:** Primary (α) Acute
(β) Chronic
(b) **Adult:** Secondary, chronic
(c) **Seniles:** Secondary, chronic
(d) **Death:** Retrograde, multiple

Causal theories·
(a) **Foreign body** response secondary
(b) Local neuro muscular **spasm:** primary

Varieties: (a) **Primary:** Irregular peristalsis
in (α) Infants
(β) Death
(γ) Lead poisoning
(b) **Secondary:** Foreign body reaction
in: (α) Growths
(β) Meckel's diverticulum
(γ) Henoch's purpura

Sites. (A) **Gastro-enteric:**
: Post gastro jejunostomy
: **Gastro-jejunal** retrograde
(B) **Enteric:** 10%; adults, secondary
: **Ileo-ileal**
(C) **Entero colic:** 85%, infants; primary
(a) **Ileo colic**
(b) **Ileo-cæcal**
(c) **Entero-ileocæcal**
(D) **Colic:**
(a) **Cæcal**
(b) **Appendicular**
(c) **Colo-colic**

Path· (1) Receiving layer: intussuscipiens
(2) Returning layer } Intussusceptum
(3) Entering layer }
(4) Neck: joins receiving and returning layers
(5) Apex: joins entering and returning layers

(6) Mesentery :
- Between entering and returning layers
- Causes the horse shoe curvature

Compl (1) Adhesions → irreducibility
(2) Acute intestinal obstruction
(3) Strangulation :
↓ (a) Perforation } → Peritonitis
or (b) Gangrene }

Clinic. (A) **Acute intussusception :**
(1) Fine, lusty, male infant
(2) **Severe, recurrent intestinal colic**
(3) Vomiting
(4) Tenesmus with bloody stools
(5) **Shock :** Peritonism
(6) Firm, curved, **periumbilical swelling :**
Intermittent appearance
Varying consistency
(7) Rectal examination positive or negative

(B) **Chronic intussusception :**
(1) Recurrent intestinal **colic**
(2) Diarrhœa with blood and mucus
(3) Concave **periumbilical swelling**
(4) **Visible peristalsis**
(5) Rectal examination

(C) **Acute-on-chronic intussusception :**
Acute culmination of chronic intussuscept.

Sign Barium enema or meal in chronic cases

Diff diag (A) **Acute :**
(1) **Acute enteritis or dysentery**
(2) Intestinal purpura Henoch
(3) Typhoid hæmorrhage
(4) **Simple intestinal colic**
(5) Other causes of acute intest. obstruction

(B) **Chronic :**
(1) **Chronic dysentery**
(2) Intestinal T. B or tabes mesenterica
(3) **Prolapse rectum**
(4) Other causes of chronic intest. obstruc.

Compl : (1) Strangulation :
(a) Gangrene
(b) Perforation
(c) Peritonitis
(2) Paralytic ileus

Treat: (A) *Early cases:*

: Retrograde hydrostatic reduction :

By. (*a*) Saline pressure
(*b*) Barium pressure

Tech: (1) Insertion of non-lubricated catheter in the rectum for 3 inches
(2) Saline reservoir 3.5 feet high
(3) Pinching of the buttocks
(4) Run in saline for 4 minutes
(5) Run it out
(6) Repeat

(B) *Late cases:* **Operative**

Pre-oper: Anti shock treatment

Anæsth: (1) General
(2) Spinal 2 c.cs. stovaine in saline
. Lateral position
. Small needle
. Between 2nd and 3rd lumbar
: Do not allow the escape of fluid

Tech: (A) *Good general condition + reducibility:*

: Reduction :

(*a*) **Squeezing:** Milk out; *never pull*
(*b*) **Cope:** Finger method
(*c*) **Daw:** Forceps method
(*d*) **Brown:** Incision method

(B) *Good general condition + Irreducibility.*

(1) *Inner layers irreducible or gangrenous:*
: **Barker:** Resection of intussusceptum through an incision in the intussuscipiens

(2) *All layers gangrenous* ·
: **Excision of all three layers**
+ Anastomosis:
(*a*) Without proximal drain
(*b*) With proximal drain

(C) *General condition bad.*

(1) *No gangrene but irreducible:*
: **Short circuit**

(2) *Gangrene:*
(*a*) **Rapid resection + limb drainage**
(*b*) **Exclusion + proximal stomy**

Operations for irreducible intussusception ·

(1) **Enterostomy :** Proximal

Ind General condition very bad

(2) **Short Circuit :**

Ind (*a*) General condition not good
+ (*b*) Irreducible but not gangrenous

(3) **Resection :**

Ind (*a*) General condition good
+ (*b*) Irreducible or gangrenous

Tech (1) Total resection
(2) Excision of the intussusceptum
(3) Anal resection low intussusception

Methods { (*a*) Without proximal drainage
{ (*b*) With proximal drainage
{ (α) With end to end anastomosis
{ (β) With lateral anastomosis

After treat (1) First 24 hours shock period
(*a*) Trendelenburg
(*b*) Hydrotherapy
(*c*) Nepenthe 1 m every 3 hours
(2) After 48 hours reaction period

Post compl (1) Shock
(2) Acute gastric dilatation
(3) Paralytic ileus
(4) Gangrene bowel → peritonitis

Sequela Annular stricture

(3) VOLVULUS

Def Axial rotation of a portion of alimentary tract on its mesenteric axis

Etio (1) Robust adults in 3rd or 4th decade
Small intestine
(2) Seniles
Sigmoid colon

Pre disp (A) Congenital (*a*) *Undue mobility*
(*b*) Narrow pedicle
(B) Acquired (*a*) Adhesion
(*b*) Loaded lumen

Exciting Sudden effort

(A) **Volvulus neonatorum :**
(See above)

(B) **Volvulus of the small intestines :**

Etio **Robust adults of Indian farmer class**
Common in Bombay and Poona

Path: **Clockwise** twist of the ileum
↓ (*a*) Obstruction
↓ (*b*) Congestion
↓ (*c*) Strangulation
↓ (*d*) Gangrene
↓ (*e*) Peritonitis
↓ (*f*) Paralytic ileus

Clinic: Acute low small intestine obstruction

Special: After exploration:
(1) **Multiple tight band-like feel**
(2) Terminal ileum and cæcum collapsed
(3) **Terminal ileum coursing up** from the ileo-cæcal valve and disappearing behind a tight constriction

(C) Volvulus of the cæcum:
(1) Acute intestinal obstruction
Enormous dilatation of cæcum
(2) Chronic recurrent obstruction

(D) Volvulus of the sigmoid:

Etio. Constipated elderly men: Russia and Poland

Path: Anti clockwise twist of the sigmoid

Clinic: **Acute large intestine obstruction:**
With. (*a*) **Enormous left-sided distension**
(*b*) Tenesmus and rectal ballooning
(*c*) Inability to pass enema or rectal tube

Compl: *Of volvulus*
(1) **Strangulation**
↓ (*a*) Gangrene, (*b*) Perforation → Peritonitis
(2) **Paralytic ileus**
(3) Toxæmia and dehydration
(4) Recurrence

Treat: (A) **Volvulus of the small intestines:**
Tech (1) Undo the twist
↓ (2) Enterostomy:
: If condition bad + no gangrene
or (2) Resection + limbs drainage
↓ Secondary anastomosis:
: If condition bad + gangrene
or (2) Resection + immediate anastomosis:
: If condition good + gangrene
or (2) Simple undoing the twist:
: If condition good + no gangrene

Post. compl: **Shock**: Due to evisceration

(B) Volvulus of the cæcum:
(1) Detorsion → cæcopexy:
: Early cases
(2) Detorsion → (a) Cæcostomy
or (b) Appendicostomy
: Doubtful cases
(3) Resection → Ileo colostomy:
: Gangrene + general condition good
(4) Exteriorisation → proximal drainage:
: *Gangrene + general condition bad*

(C) Volvulus of the sigmoid:
(1) **Conservative:**
. Rectal tube . (a) Knee elbow position
or (b) Sigmoidoscopic
(2) **Operative:**
(A) **No gangrene:**
(a) Early cases:
. (α) Undo the twist
+ (β) Tie in long rectal tube
(b) Marked distension:
. (α) Tap the loop
+ (β) As in (a)
(c) Paralysed loop:
. (α) Untwist the loop
+ (β) Catheter drainage
(B) **Gangrene:**
(a) General condition bad + + +:
. (α) Exteriorisation
+ (β) Proximal drainage
(b) General condition bad + +:
: (α) Excision
+ (β) Drainage both ends
(c) General condition bad +:
(α) Basal lateral anastomo
+ (β) Apical drainage
(d) General condition good:
. (α) Excision
+ (β) Anastomosis
+ (γ) Cæcostomy

(4) INTESTINAL KNOTS:
Etio Finland
Path Knots of mobile intestine
Clin c. Acute small gut obstruction

(5) BANDS, ADHESIONS AND APERTURES:
(A) BANDS:
Etio. (1) **Inflammatory:**
(a) Peritoneal

(b) Omental
(c) Anatomical structures:
(α) Appendix
(β) Meckel's diverticulum
(2) **Traumatic:** Post-operative adhesions
(3) **Congenital:** Meckel's diverticulum

Clinic: (a) **Past peritonitis or laparotomy**
(b) Acute intestinal obstruction
(c) **Blood:** (α) Hæmoperitoneum
(β) Per rectum

(B) ADHESIONS:

Etio: (a) Inflamed intraperitoneal structure
(b) **Plastic peritonitis:** T. B.
(c) Diverticulitis or regional ileitis
(d) Malignancy
(e) **Post-operative:**
(α) Early: one to three weeks
(β) Late: months or years after

Path: (1) **Local:** Appendix, salpinx
(2) **General:** T. B.; general peritonitis

Mechanism: (1) Kinking
(2) Compression
(3) Distortion of lumen
(4) Arrest of peristalsis
(5) Volvulus

Clinic: (1) Acute-on chronic obstruction
(2) Chronic obstruction

Special: (a) **History of previous trouble**
(b) Visible peristalsis marked

Compl: Recurrence

(C) APERTURES:

Etio: (1) Congenital
(2) Traumatic
(3) Operative

Sites. (1) Mesenteric
(2) Omental
(3) Broad ligamental

Clinic: Acute intestinal obstruction

Treat: *Of intestinal obstruction due to bands, adhesions, or apertures:*

(A) General condition bad + no gangrene:
(1) Conservative
↓ (2) Exploration + blind enterostomy

(B) General condition bad + gangrene
(1) Exploratory laparotomy
↓ (2) Exteriorisation + proximal drainage
or (2) Excision + limbs drainage
(C) General condition good + gangrene
(1) Exploratory laparotomy
↓ (2) Excision + anastomosis
(D) General condition good + no gangrene
(*a*) Removable etiology
Remove (excision of the band)
(*b*) Irremovable etiology
Circumvent (short circuit)

(6) INTERNAL HERNIÆ

Varieties (A) Diaphragmatic (See under Diaphragm)
(B) Peri duodenal
(*a*) Para-duodenal left duodeno-jejunal
Inferior mesenteric vein
(*b*) Mesenterico-parietal right duodeno jejunal
Superior mesenteric artery
(*c*) Foramen of Winslow
(α) Portal vein
(β) Bile duct
(γ) Hepatic artery
(C) Peri-caecal
(*a*) Superior ileo-cæcal
Between meso appendix and mesentery
(*b*) Inferior ileo-cæcal ileo appendicular
Between fold of Treves and meso appendix
(*c*) Retro-cæcal
(D) Inter-sigmoid
(E) Pelvic
(F) Obturator

Clinic *Acute intestinal obstruction with strangulation*
(1) High small gut peri-duodenal
(2) Low small gut peri-cæcal
inter-sigmoid

Special (*a*) Virulent course
(*b*) Toxæmia + +
(*c*) Hæmorrhage in lumen and peritoneum

Compl (1) Strangulation → gangrene } → peritonitis
↓ perforation }
(2) Obstruction → paralytic ileus
(3) Toxæmia and dehydration

Treat (1) Reduction Without injury to (*a*) Contents
(*b*) Neck
↓ (2) Closure of the entry to the fossa
Tech (*a*) Reduction by manipulations
or (*b*) Decompression of the gut
↓ Reduction
+ (3) Treatment of obstruction

(7) OBTURATION: **Lumen obstructions**

Site: (1) Duodeno jejunal flexure: foreign body
(2) Ileo-cæcal junction: gall stone
: worms
(3) Cæcum
(4) Sigmoid } : fæcolith

Age: (1) Children: (*a*) Worms
(*b*) Foreign bodies
(2) Fat females: gall stones
(3) Seniles. fæcal impaction

Path: Obstruction → impaction → paralytic ileus

(A) **Foreign bodies:** (See under Gastro duod.)

Etio: Children, hysterics, lunatics

Objects: Coins, toys

Sites (*a*) Duodeno jejunal flexure
(*b*) Ileo cæcal valve

Clinic: (1) History or no history
(2) Recurrent colicky pains with vomits
(3) High or low small gut obstruction

Compl: Impaction
↓ (*a*) Obstruction → paralytic ileus
or (*b*) Ulceration → perforation → peritonitis

Treat (1) Non dangerous:
. Conservative
(2) Potentially dangerous:
: Observative
(3) Dangerous
: Operative

(B) **Worms:** Ileus verminosus

Etio: Children

Site. Lower ileum

Clinic. (1) History or no history of passing worms
(2) Acute low small gut obstruction

Compl: (*a*) Strangulation → peritonitis
(*b*) Perforation → peritonitis
(*c*) Obstruction → paralytic ileus

Treat: (1) Acute stage: conservative
↓ (2) Convalescence: santonin

(C) **Gall stones:**

Etio: Usually elderly females between 60 and 80 years

Path: (*a*) Cholelithiasis
↓↑ (*b*) Cholecystitis
↓ (*c*) Natural cholecysto-duodenostomy
↓ (*d*) Passage of gall stone into the intestine
↓ (*e*) Impaction in the lower ileum

Site: Lower part of the ileum

Clinic: (1) Age and sex
(2) History and signs of gall stone troubles
(3) Recurrent colicky attacks with vomits
(4) Acute low small gut obstruction:
(a) Early, copious, stercoraceous vomits
(b) Intermission of symptoms
(c) Absence of distension

Compl: (a) **Paralytic ileus**
(b) Peritonitis
(c) Heart failure: (Fatty heart)
(d) Cholæmia : (Jaundice)

Treat: **Operative:**
(A) Pre-operative (a) Gastro-duodenal suction drain
(b) Intravenous glucose-saline
(B) Operation (1) Laparotomy. right paraumbilical
(2) Exploration of lower ileum
(3) Exteriorisation and isolation of the loop
(4) Milking the stone into normal part:
(a) *Proximal*
(b) Distal
(5) Longitudinal incision
(6) Extraction of stone
(7) Empty the proximal intest.
(8) Transverse suture
(Do not meddle with gall bladder)
(9) Closure

(D) Fæcal impaction:

Etio Constipated **seniles**

Path ↑ (c) Perforation → Peritonitis
↑ (b) Ulceration } → Diarrhœa
↑ (a) Irritation }
: **Constipation**
↓ (a) Stagnation → Toxæmia
↓ (b) Obstruction } → Ileus
↓ (c) Impaction }

Clinic (1) Obstinate chronic constipation
(2) Chronic low small or large gut obstruction
(3) Subacute intestinal obstruction

Special. **Mouldable swelling** in either iliac fossa

Diff diag (a) Diverticulitis
(b) Carcinoma

Treat: (A) **Conservative:**
(1) Frequent glycerine enemas
(2) Laxatives: liquid paraffin
↓ (B) Cæcostomy: if acute obstruction

(E) Enteroliths and stercoliths:

Etio: Minerals, cellulose

mplications : Of obturation or lumen obstruction

(1) Enteritis
(2) Stercoral ulcer
(3) Perforation
(4) Peritonitis
(5) Obstruction
(6) Paralytic ileus
(7) Gangrene
(8) Toxæmia . acute or chronic

(8) STRICTURE OBSTRUCTIONS:

Etio: (A) **Congenital atresia:**
- (*a*) Duodenal
- (*b*) **Meckel's diverticular**
- (*c*) Ileal
- (*d*) **Junctional: mid and hind gut**

(B) **Traumatic:**
- (*a*) Rupture
- (*b*) **Anastomosis:** End to end

(C) **Ulcerative:**
- (*a*) Typhoid
- (*b*) **Tubercle:** Multiple strictures
- (*c*) Ulcerative colitis
- (*d*) Regional ileitis
- (*e*) Dysenteric
- (*f*) Diverticulitis
- (*g*) **Strangulation: local**

(D) **New growths : Carcinoma (scirrhus)**

Path: (1) Stricture
↓ (2) Obstruction to contents
↓ (3) Irritation → œdema of the proximal part
↓ (4) Impaction of contents
↓ (5) Acute on chronic intestinal obstruction

Clinic: **Acute-on-chronic** intestinal obstruction:
(*a*) History of etiology
↓ (*b*) Chronic obstruction
↓ (*c*) Recurrent subacute attacks
↓ (*d*) Acute on chronic obstruction

Treat · (A) *Condition bad*
: **Artificial anus**

(B) *Condition good :*
(*a*) Removable etiology:
: **Excision and anastomosis:**
(α) One stage: without or with drainag
(β) Two stage: (1) Drainage
↓ (2) Excision

(*b*) Irremovable etiology:
: **Short circuit**

(9) GROWTHS OF THE INTESTINES:

Etio : Carcinoma
. Old people

Sites. (a) **Recto sigmoid,** sigmoid
(b) Flexures splenic, hepatic
(c) **Cæcum**

Path (1) **Primary:** Due to growth itself
(2) **Secondary:** Due to
(a) Pressure
(b) Infiltration
(c) Adhesions
(d) Kinking
(e) Volvulus
(f) Intussusception
(g) Secondaries

Clinic (1) Seniles
(2) Chronic, recurrent intestinal obstruction
↓ (3) Acute on-chronic intestinal obstruction

Special (a) Mass in one of the common sites
(b) Secondaries

Compl (1) Perforative peritonitis
(2) Paralytic ileus

Treat (1) **Proximal drainage:** If condition bad
(2) **Short circuit:** If irremovable
(3) **Excision (two stage):** If removable

(10) MESENTERIC THROMBOSIS.

Etio (a) Heart and blood vessels affections:
(α) Endocarditis
(β) Atheroma
(b) Local contusion

Path. (A) Arterial
(a) Primary vascular disease
↓ (b) Embolism
↓ (c) Secondary mesenteric thrombosis
↓ (d) Ischæmia of the bowel wall
↓ (e) Gangrene
(B) Venous
(a) Thrombosis due to·
(α) Portal obstruction
(β) Peripheral sepsis
↓ (b) Vascular stagnation
↓ (c) Gangrene

Clinic: (1) Etiological disease
(2) Sudden virulent acute intestinal obstruction:
(a) Bloody stools
(b) Hæmo peritoneum

(c) Early paralytic ileus
(d) Early and profound shock
(e) Prominent toxæmia

Treat · **Immediate laparotomy** ·

Diagnosis (a) Bloodstained effusion
(b) Blue or purple gut
(c) No mesenteric pulsations

Tech (1) **Resection of**
(a) Infarcted segment
+ (b) Healthy margins
Proximal and distal one foot
+ (c) Thrombosed mesentery
↓ (2) **Anastomosis**

(11) PARALYTIC ILEUS

Def. Loss of the propulsive power of the intestines due to paralysis of musculature

Etio (1) *Local causes*

(a) **Lesions of intestinal musculature:**

Causes (α) Over purgation
In obstructive lesions
(β) **Late stages of simple mechanical obstruction**
(γ) **Strangulation**

Path (1) Ischæmia
(2) Exhaustion

(b) **Changes in myo neural junctions:**

Causes (α) Traumatic shock
(β) Anæsthesia

Path Destruction of acetyl choline

(c) **Lesions of Auerbach's plexus:**

Causes (α) Peritonitis
(β) Strangulation
(γ) Thrombosis
(δ) **Toxic states**

Path (1) Inflammation
(2) Ischæmia
(3) Lowered sensibility

(d) **Sympathetic lesions:**

Causes (1) **Operative trauma**
(2) **Peritoneal irritation**
(3) **Peritonitis**
(4) Intestinal torsions→strangulation

Path. Sympathetic irritation

(c) **Post-operative ileus:**

Causes (α) Anal spasm → meteorism → ileus
(β) Paralytic:
(1) Nervous
Exposure and trauma
(2) Mechanical exhaustion
(γ) Peritonitis: toxic

(2) *Referred causes*. Spinal paralysis:
(α) Traumatic
(β) T B

(3) *General toxæmias*
(a) Toxæmia Typhoid
(b) Septicæmia
(c) **Uræmia**

Morb anat (1) **Cessation of peristalsis:**
(a) Local
(b) General

(2) **Distension:**
(a) Local
↓ (b) Regional } (α) Small gut
↓ (c) General } (β) Large gut

(3) **Spasm of the sphincters:**
(a) Duodeno jejunal
(b) Ileo cæcal
(c) Recto sigmoid
(d) Anal

Clinic (A) *History*
(1) **History of etiology:**
(a) Peritonitis
(b) *Intestinal obstruction*
(c) Operation
(d) General toxæmias typhoid

(B) *Local*
(2) **Mild inhibition of peristalsis:**
24–72 hours
(a) Constipation
(b) Tympanitis
(c) Distension

(3) **Paralytic ileus:**
(a) **Cessation of passage of flatus**
(b) **Absence of peristaltic sensations**
(c) **Absence of intestinal pain**
(d) Distension + +
(e) Vomiting
. *(Variable according to position)*

(e) **Dead silence on auscultation**
(f) Ballooned rectum
(If primary in large intestine)

(C) *Referred*
(4) **Referred signs.**
(a) Respiratory embarrassment
(b) Cardiac embarrassment

(D) *General*
(5) **Shock, toxæmia and dehydration**

Differential Diagnosis

Symptoms and signs	*Ileus*	*Obstruction*
Pain	Continuous or nil	Mechanical colicky
Vomit	+ +	+ +
Visible peristalsis	—	+
Audible peristalsis	—	+
Distension	Early and rapid	Late and slow
Course	Rapid	Slow
Toxæmia	+ +	— or slight
Peristaltic stimulators	Good effect	No effect
Hypertonic intravenous	Good effect	No effect
Spinal anæsthesia	Good effect	No effect

Compl (A) Local
(1) Distension necrosis
↓ (2) Peritonitis

(B) Regional
Chest complications

(C) General
(a) Dehydration
(b) Uræmia
(c) Toxæmia

Treat (A) **Preventive:**
(I) *Pre-operative prophylaxis*
(a) Re-assurance
(b) Have empty stomach and intestines
(c) Avoid drastic purging
(d) Morphia

(II) *Operative prophylaxis*
(a) Avoid general anæsthesia
(b) Avoid unnecessary trauma
(1) Unnecessary explorations
(2) Unsuitable incisions
(3) Forcible retractions

- (4) Rough handling of peritoneum
- (5) Evisceration and exposure
- (6) Dragging or tearing of mesenteries
- (7) Flushing of peritoneum
- (8) Denudation of peritoneal covering

(III) *Post operative prophylaxis*

- (a) Rest (α) Morphia
  - (β) Nothing by mouth
- (b) Anal spasm
  - (α) Flatus tube
  - (β) Routine anal stretching
    After every laparotomy
- (c) Vomit gastric drainage
  If persistent after 6 hours
- (d) Rectal hydrotherapy
- (e) Potter's preventive treatment
  Pitressin ½ c.c. intramuscular
  B D for 8–12 days

(B) Therapeutic

(1) *Post operative meteorism*

- (a) Ol cajuputi min 1
- (b) ℞ Aspirin grs. xv
  Soda bi carb dr ½
  Sal volatile dr ½
  Aqua menth pip ounce ½
- (c) Flatus tube every four hours
- ↓ (d) Turpentine enemata

(2) *Early cases (Within 24 hours)*

- (a) Morphine or heroin
  Small repeated doses
- (b) Nothing by mouth
- (c) Duodenal catheter
- (d) Intravenous glucose saline
- (e) Continuous heat to the abdomen

(3) *Established cases (After 24 hours)*

- (a) Drugs
  - (α) Morphine
    ¼ gr every six hours
  - (β) Acetyl choline
    0 1 gm intramuscular
    Hourly for 6 hours
- (b) Duodenal suction drainage
- (c) I v hypertonic saline drip
  To meet fluid requirements

(α) 10% sod chloride
(β) Ringer
(γ) Hartmann

(d) Enemata
(α) Ox bile injection
↓ Turpentine enema
(β) Acetyl choline + Hypertonic saline } → enema

(e) Spinal anæsthesia
Frees Auerbach from inhibitory influence of irritated sympathetic

(f) Splanchnic anæsthesia

(4) *Late cases Operation treatment*
Ind Failure of conservatism
15 mins. after spinal anæsthesia

(A) *Early stages*
(a) Duodenal suction drainage
↓ (b) Re opening the original incision
With treatment of focus
or (b) Low ileostomy
Through a stab wound

(B) *Late stages*
(a) Cæcostomy
(b) Blind enterostomy
Tech (α) Local anæsthesia
(β) Incision
Small left paraumb
(c) Short circuit
Jejuno transversostomy
+ Cæcostomy

Post oper Stimulation of peristalsis
(1) Small repeated doses of morphia
(2) *Acetyl choline*
(3) I v hypertonic glucose saline
(4) Duodenal suction drain

XI) OPERATIONS ON THE INTESTINES

(A) PRE-OPERATIVE PREPARATIONS

(1) Oral hygiene
(2) Gastro intestinal hygiene
(a) Laxatives
(b) Intestinal antiseptics
(c) Gastric and colon washes

(3) Peritoneal hygiene.
: Anti-gas-gangrene serum
(4) Attention to
(a) Respiratory system
(b) Cardiac system
(c) Urinary system
(5) Anti-shock preventive preparations
(6) Paralytic ileus preventive measures

(B) INDIVIDUAL OPERATIONS.

(1) ENTEROTOMY.

Def Incision into -> treatment of internal focus -> closure: Of the intestines

Ind (1) Removal of foreign bodies
(2) Emptying a distended coil

Tech (A) Foreign bodies·
(1) Milking into proximal healthy part
(2) Emptying and clamping
(3) Isolation by gauze packs
(4) Incision · (a) Longitudinal
+ (b) Anti mesenteric
(5) Withdrawal of foreign body
(6) Suture (a) Transverse
(b) Two layers
(7) Closure

(B) Decompression
(1) Isolation by clamps and gauzes
(2) Purse string (a) Sero muscular
+ (b) Anti mesenteric
(3) Trocar and cannula with rubber tube
(4) Tighten the purse-string
(5) No rough handling or milking

(2) ENTEROSTOMY

Def Temporary or permanent inlet to the intestinal cavity

Ind. (1) Feeding Jejunostomy
(2) Drainage: (a) Ileostomy
(b) Cæcostomy
(c) Transverse colostomy
(d) Left iliac colostomy

(A) JEJUNOSTOMY

Ind. (1) Carcinoma lower end of œsophagus
(2) Extensive carcinoma stomach
(3) Gastro-duodenal ulcers:
(a) Extensive area
(b) Hæmorrhage
(4) Cicatricial contraction of the stomach
(5) Gastro-jejunal or jejunal ulcers
(6) Gastro-jejuno-colic fistula
(7) Paralytic ileus on intestinal obstruction
(8) General peritonitis

Tech (a) Witzel
(1) Local anæsthesia
(2) Incision Left trans rectus
(3) Palpate the duodeno jejunal flexure
(4) Pack off jejunum 8 from the flexure
(5) Incision anti mesenteric
(6) Tube No 12 catheter
(a) Anchor stitch
(b) Bury along anti mesent border
Direct towards distal part
(7) Omental interposition
(8) Intesto peritoneal fixation
(9) Closure
(b) Wangensteen s modification of Witzel
(1) Catheter scoring for anchor suture
(2) Burying the catheter into the wall before opening the intestine
(c) Ravdin
(1) Incision (a) Ant. axillary line
(b) Tip of 11th costal cartilage
↓ (c) Downwards 2"
(2) Muscle incis on in line of (1)
(3) Peritoneal opening
(4) Clamp and isolate a jejunal coil
(5) Stitch in No 14 catheter
(6) Stitch the loop-apex to peritoneum
(7) Closure
After treat (1) Glass connection → short rubber tube → bottle
(2) Run in soda bi-carb sol ounces VI at intervals
(3) Clamp the tube when no foul smell
(4) Remove the catheter on 10th day
(5) Emollient dressings to the surroundings

(B) ILEOSTOMY

Ind Drainage in Acute intestinal obstruction
Paralytic ileus
Regional ileitis
(1) **Blind**·
(a) Very bad general condition
\+ (b) Late small gut obstruction
\+ (c) No strangulation
(2) **Terminal or additional.**
(a) Small gut obstruction
\+ (b) Obstructive cause dealt with
\+ (c) No strangulation left in
\+ (d) Paralytic ileus potential or actual
Tech (1) Removal of the cause of obstruction
(2) Withdraw → empty → clamp → pack off
Proximal coil at a distance from the focus

(3) Open and insert the tube.
  (a) Witzel method
  (b) Purse string method
(4) Omental interposition
(5) Intesto peritoneal fixation
(6) Closure

(C) CÆCOSTOMY

Ind (1) **Drainage:**
  (a) Life saving measure in (Blind)
    (α) Acute large gut obstruction
    (β) Paralytic ileus
  (b) Preliminary to or additional to
    Large bowel resection or anastomosis
(2) Irrigation
  (a) Ulcerative colitis
  (b) Dysentery
  (c) Chronic colon obstructions
(3) Fixation
  Volvulus of the cæcum

Tech (1) **Grid-iron incision**
(2) Peritoneal incision
(3) Puncture of the cæcum with cannula
(4) Isolation of the cæcum
(5) Purse string
(6) Cæco peritoneal fixation
(7) Incision and insertion of
  (a) Catheter
  (b) **Paul s tube**
(8) Ink bottling of catheter or Paul s tube
(9) Closure
(10) Continuous bottle drain

Difficulties (a) Spontaneous perforation of the cæcum
(b) Gangrene of the cæcum
(c) **Non mobile cæcum:**
  · **Do transverse colostomy**

After treat (1) Skin protection with lanolin
(2) Drainage into the bucket
(3) If no drain, run in
  (a) Water one pint every hour
  (b) Mag sulph one ounce in water one pint
    At the end of 24 hours

(D) APPENDICOSTOMY

Ind (1) Chronic colitis (a) Ulcerative
  (b) Dysenteric
(2) Obstinate chronic constipation
(3) Ileo-cæcal intussusception

(4) Cæcal volvulus
(5) Paralytic ileus

Tech: (1) Anæsth: local, regional, general
(2) Incision: (a) *Grid iron*
(b) Stab
(3) Exteriorisation of appendix
(4) Cæco-peritoneal fixation
(5) Closure of the peritoneum:
: Around the appendicular base
(6) Appendico-aponeurotic fixation
(7) Excision of the protruding part of the appendix
· 4 days later
(8) Introduction of catheter

(E) TRANSVERSE COLOSTOMY:

Ind: (1) **Blind**: Life saving measure
: In acute large gut obstruction
(2) **Carcinoma distal colon**: (a) Splenic flexure
(b) Descend. colon
(c) Pelvic colon
(d) Rectum
: (a) As a temporary drainage:
: In operable growths
(b) As a permanent drainage
: In inoperable growths
(3) When cæcostomy and left inguinal colostomy are impossible due to fixity

Tech: (A) Classical method.
(1) Incision:
: Left or right paramedian para umbilical
↓ (2) Bring out a loop of transverse colon:
: Through a hiatus in omentum
↓ Through the rectus muscle
↓ (3) Other steps: as in left iliac colostomy
(B) Wangensteen method:
(1) Small, local, transverse incision
(2) Exteriorisation of transverse colon loop
(3) Fixation to the skin
(4) Aspiration: immediate → 6 hours
(5) Open. after 24 hours

Advantages: (a) **Faeces more solid than caecostomy**
(b) **More manageable than sigmoidostomy**

(F) LEFT INGUINAL COLOSTOMY:

Ind: (A) *Rectal lesions:*
(a) **Imperforate anus**

(*b*) **Inveterate ulcerative proctitis**
(*c*) Tuberculosis rectum
(*d*) Stricture rectum
(*e*) **Vesico-rectal fistula**
(*f*) **Carcinoma rectum** (inoperable)

(B) *Colon lesions :*
(*a*) Severe colitis . ulcerative
: membranous
(*b*) Diverticulitis
(*c*) Stricture sigmoid
(*d*) Volvulus of the sigmoid
(*e*) Carcinoma colon

(C) *Pelvic cellulitis or carcinoma :*
Implicating the colon or rectum

(1) *Inflammations · chronic*
(2) *Ulcerations . inveterate*
(3) *Fibrosis*
(4) *Carcinomata*
(5) *Fistulæ*
(6) *Volvulus*
} *of the colon and rectum*

Ind: *Of blind left inguinal colostomy :*
(1) Carcinoma pelvic colon
(2) Acute or chronic obstruction:
With inoperable carcinoma felt per rectum

Contraind. (*a*) No growth felt
(*b*) Pelvic colon collapsed

Tech · (1) Incision
(A) **Left grid-iron McBurney**
or (B) Centre at the middle of left spino umbilical line
or (C) Just below the umbilicus·
: '75" internal to outer border of left rect.
: (Lockhart Mummery)
or (D) Left paramedian, sub umb , trans rectus
Length: 2 inches
(2) Peritoneal incision
(3) Identification and exteriorisation of colon
(4) Selection of the spot:
(*a*) Descending colon nearly taut
(*b*) 4"–5" of sigmoid above the colostomy
(5) **Mesenteric fixation :** By glass rod
(6) **Fixation of the bowel :**
(*a*) At either end
(*b*) To peritoneal margins

(7) Excision of appendices epiploicæ
(8) Formation of stoma:
 (a) Immediate
 (b) Delayed: 3 days after
(9) Excision of the projecting loop + Withdrawal of glass rod } 10th day

Methods of stoma:

(1) **Paul: No spur method**
 (a) Part of the circumference fixed to perit
 (b) Open the colon in long axis
 (c) Suture the colon margins to incision
 or (c) Tie in Paul's tube

(2) **Two separate stomata**

(3) **Madelung:**
 (a) Transverse division of colon
 (b) Closure and dropping in of lower segment
 (c) Colostomy of the upper segment

(4) **Lilienthal: Artificial sphincter**
 (a) Transverse division of colon
 (b) Axial rotation of upper end
 (c) Tube tied in for one week

Time of stoma:

(1) Immediate:
 Ind: Complete obstruction
 Tech: (a) Paul's tube method
  (b) Rubber tube method
(2) Delayed: after 2 or 3 days

Difficulties and errors of operation:

(1) Difficulty of identification.
 : Rectal injection of water
(2) Anchored immobile colon·
 : Mobilisation
(3) Twist of the withdrawn loop
(4) Neglect of colo peritoneal fixation
(5) Solid fæces in proximal loop

Post. treat: (A) **Management:**
 (a) Opening the loop and tying in Paul's tube:
  (α) Immediate
  (β) 3rd day
 (b) Removal of glass rod
  : 6th day
 (c) Excision of prolapsed bowel:
  : 8th day
 (d) Removal of Paul's tube:
  : When it comes out

(B) **Diet:**
- (*a*) Restrict the fluids
- (*b*) Dry, light, bland solids
- (*c*) Avoid: tomato, onion, fruit, cream

(C) **Medicines:** Astringents and antiseptics
- (*a*) Charcoal: B D.
- (*b*) ℞. Bismuth salicylas, Salol, Betol } : āā grs. 5
- (*c*) Kerol m. iii in capsule B.D

(D) **Bowels:**
- (*a*) Aperient: as soon as bowel is opened
- (*b*) Bowel habit: morning enema
- (*c*) Irregularities:
  - (α) Constipation. laxatives
  - (β) Diarrhœa: pulv. ipecac. co . grs. 5 B.D.

(E) **Wound:**
- (*a*) Stoma:
  - (α) Irrigations of both openings: B D.
  - (β) Colostomy appliances:
    - (1) Belt with wool pad (may be used)
    - (2) Belt with cup (not necessary)
- (*b*) Skin dressings:
  - (α) Dry powdering
  - (β) Starch + egg albumen + olive oil
- (*c*) Daily bath

Post compl: (A) *Local intestinal:*

(1) **Prolapse:** Of small intestine or omentum
- Clinic. Intestinal obstruction
- Cause: Failure to fix colon to peritoneum
- Prophylaxis: (*a*) Small incision
  - (*b*) Colo peritoneal fixation

(2) **Strangulation:**
- : Between colon & parietes
- Treat: (*a*) Colostomy near ant. sup. spine
  - (*b*) Fixation of colon limb to parietes

(3) **Gangrene:** Of outside loop

(4) **Mesenteric phlebitis** → portal pyæmia

(B) *Abdominal:*
- (1) Paralytic ileus
- (2) Peritonitis

(C) *Wound infection and sequelæ:*
- (1) Abscess
- (2) Cellulitis
- (3) Gangrene

(4) **Extensive ulceration**
(5) Ventral hernia:
Causes: (*a*) Outer rectus incision
(*b*) Cup belt
(*c*) Straining

(D) *Stoma abnormalities:*
(1) Tearing and **falling in of stoma**
(2) **Stricture:**
Treat: Regular dilatation
(3) **Prolapse:**
Treat: (*a*) Small opening
(*b*) High opening
(*c*) Valvular opening
(*d*) No redundancy
(*e*) Rest
(*f*) Laxatives
(4) **Incontinence:**
Treat: (*a*) As in (3)
(*b*) Lilienthal method
(*c*) Trans-rectus method
(5) **Spur retraction**
(6) Invasion by primary condition:
: **Carcinoma**

(G) INVAGINATION OF GANGRENOUS INTESTINES:
Ind: Small localised or annular gangrenous patch
Contraind: (*a*) Gangrene > 3"
(*b*) Œdematous wall
(*c*) Difference in proximal and distal lumen
Tech: (1) Purse-string
(2) Linear·
(α) Excision of V mesentery
(β) Tucking in by 4 angular sutures
(γ) All round continuous suture
(δ) Closure of mesenteric gap
Sequela: Stricture

(H) ENTERECTOMY AND ANASTOMOSIS:
Ind: (1) Severe **trauma** to bowels &/or mesentery
(2) **Gangrene** of the bowels
(3) **Carcinoma**
(4) **Tuberculosis:** Localised
(5) **Chronic inflammations:** Local or regional
(6) **Fæcal fistulæ**
Method: (1) **Enterectomy**
↓ (2) **Anastomosis:**
(*a*) **End-to-end:** Closure of neither end
(*b*) **End-to-side:** Closure of lower end

(c) **Side-to end:** Closure of upper end
(d) **Side to side:** Closure of both ends

Sites: For enterectomy
(A) Upper healthy bowel well away from focus
(B) Lower two inches below the focus
(C) *Healthy blood supply to both segments*

Steps (1) **Enterectomy:**
Tech (a) **Isolation** of affected loop:
By (α) Clamps
(β) Packs
(b) Excision of fan shaped **mesentery**
(c) Resection of affected **loop:**
Between crushing clamps
(2) **Anastomosis:**
Tech (a) Posterior sero muscular suture
(b) All coats through and through suture
(α) Posterior
(β) Anterior
(c) Anterior sero-muscular suture
(d) Omental graft
(e) Union of mesentery

Types (A) End to-end *Closure of neither end*
Ind Small intestine
(a) Complete serous coat
(b) Fluid contents
(c) Equal calibre
Adv Restoration of normal anatomy
Disadv (a) Disturbed nerve supply
(b) Stricture
(c) Mesenteric angle leak
Methods (1) Open method
(2) Closed methods
(α) Schoemaker
Sero-muscular method
(β) Fraser and Dott
Blind ends method
(γ) Pringle
Narrow blade forceps method
(B) End-to-side *Closure of lower end*
Ind (1) Small intestine
(2) Moynihan ante-colic gastrectomy
(3) Roux Y anastomosis
(4) Ileo-transversostomy
(5) Ileo-sigmoidostomy
(C) Side-to-end: *Closure of upper end*
Ind Ileo-transversostomy

Adv: (a) No axial rotation
(b) No œdema of stoma
(c) One blind end
(d) Emptying by gravity
(D) Side-to-side: *Closure of both ends*
Ind: (a) Short circuit
(b) Enterectomy · Isoperistaltic
Adv: (1) Elimination of mesenteric angle
(2) Stoma wider
(3) Leakage less likely
(4) Allows union of different sizes
Disadv. (a) Longer time
(b) Requires greater length
(c) Distension -> rupture of proximal blind end

(I) INTESTINAL EXCLUSION:
Def: Diversion of flow of contents away from the diseased part
Ind: (1) Intestinal obstruction ·
(a) Removable · as preliminary
(b) Irremovable: as permanent
(2) Fæcal fistula
(3) Colonic stasis
Varieties: (a) Temporary or preliminary. to excision
(b) Permanent: as a palliative
Tech · (A) Bilateral partial ·
Syn: (a) Lateral anastomosis
(b) Short circuit
Ind (1) Chronic obstruction:
(a) Growth
(b) Fibrosis:
(α) Stricture
(β) Matting & adhesions
(γ) Kinks
(2) Faecal fistula
(3) Gangrene bowel.
: As an addition to:
(a) Excision
(b) Exclusion
(c) Drainage
(4) Recurring volvulus
(5) Regurgitant vomit
Tech. Side to-side anastomosis without closure of either end
(B) Unilateral complete:
Ind. (1) Artificial anus
(2) Fæcal fistula
(3) Colitis
(4) Irremovable growth of the colon
(5) Ileo-cæcal tuberculosis

Tech (a) Complete division above the focus
(b) End to side anastomosis below the focus
(c) Closure or drainage of distal end
(C) Bilateral complete
Ind Fæcal fistula
Tech (1) Two divisions
(a) Above the focus
(b) Below the focus
(2) Anastomosis proximal to distal
(3) Closure or drainage of excluded loop

(J) COLECTOMY
Def Resection of the colon
Ind (1) Carcinoma
(2) Diverticulitis
(3) Tuberculosis Cæcum
(4) Faecal fistula
(5) Ulcerative colitis
(6) Benign growths
Extent *Of removal in radical resection for carcinoma*
(1) Local (a) 3 inches above
(b) The growth
(c) 3 inches below
(2) Regional (a) Lymph drainage
(1) Epicolic
(2) Paracolic
(3) Intermediate
(4) Main arterial
(5) Para-aortic
(b) Blood supply

Excision

Focus	*From*	*To*
Cæcum + Ascending colon	Last 6" of ileum	Beyond hepatic flexure
Hepatic flexure	Last 6" of ileum	Middle of trans. colon
Transverse colon	Proximal 3"	Distal 3"
Splenic flexure	Left ⅓rd of trans. colon	Middle of descending colon
Descending colon	Left ⅓rd of trans. colon	Middle of sigmoid
Sigmoid	Proximal 3"	Distal 3"

Pre-oper (1) Investigate and treat
- (a) Cardio vascular system Heart B P
- (b) Blood hæmoglobin coagulation
- (c) Respiratory system complications
- (d) Urinary system kidney efficiency
- (e) Alimentary system
  - (1) Mild laxatives
  - (2) Antiseptics and astringents
  - (3) Enemata and irrigations
  - (4) Diet (1) Plenty of fluids
    - (2) Carbohydrates +
    - (3) Proteins —

(2) Special steps
- (a) Blood transfusion
- (b) Glucose saline
- (c) Intraperitoneal (α) Amniotic fluid
  - (β) Mixed vaccines
- (d) Anti-gas gangrene serum

Tech (1) Adequate exposure
- (2) Thorough mobilisation
- (3) Adequate blood supply
- (4) No tension
- (5) Adequate protection to suture line
- (6) Proximal drain if necessary

Methods (A) *Paul Mikulicz 'Many Stage'*

Ind (a) Growth between
- (α) Hepatic flexure
- & (β) Terminal sigmoid
- (b) Mobilisable colon

Contraind (1) Non-exteriorisable colon
- (2) Unsatisfactory lymphatic removal

Tech (1) Resection with drainage
- (a) Exposure by direct incision
- (b) Thorough mobilisation
- (c) Division of mesenteric vessels
- (d) Exteriorisation of affected loop
- (e) Proximal suture of two limbs
- (f) Division and resection of growth
- (g) Paul s tubes in both ends

↓ (2) Spurectomy 4 weeks later
Clamping of the spur by enterotome

↓ (3) Closure of the faecal fistula

(B) *Resection with end to-end anastomosis*

Ind Acute-on-chronic obstruction

Tech (1) Two stage (a) Preliminary drainage
- (α) Cæcostomy
- *or* (β) Colostomy
- *or* (γ) Short circuit

↓ (b) Resection + anastomosis

(2) One stage:
: Resection + anastomosis + proximal drainage:
: Drainage by (a) Cæcostomy
(b) Proximal colostomy
(c) Over rectal tube

After treat: (a) If cæcostomy · keep it for 3 weeks
(b) If no cæcostomy: keep rectal tube for one week
(c) Liquid paraffin + glycerine enema:
. At the end of one week

Individual operation steps.

(1) *Ileo-cæcal valve*
Cæcum
Ascending colon
Hepatic flexure
} Two stage operation

Steps. (a) Exploration + ileo transversostomy
↓ (b) Resection:
(1) Incision:
(α) Right rectus
or (β) Muscle cutting right iliac
or (γ) Linea semilunaris
(2) Mobilisation of affected colon
(3) Exteriorisation of affected colon
(4) Ligature of ileo-colic art. and vein
(5) Division of ileum 6" from caecum
(6) Division of trans colon beyond flexure
(7) Mobilisation and ligature of mesentery
(8) Removal of colon with mesentery
(9) Restoration of continuity.
(α) Side-to-end · closure upper end
(β) End to side. closure lower end
(γ) Lateral: closure both ends
(δ) End to-end: closure neither end
(10) Suture of iliac mesentery to mesocolon
(11) Drainage of peritoneum

Save (a) Ureter (b) Spermatic vessels

(2) *Transverse colon:*

Steps: (a) Clamping and division of colon:
. 3" both ways
(b) Incision and isolation of V mesocolon
(c) Division of greater omentum
(d) Removal of: (α) Affected colon
(β) Mesocolon with lymphatics
(γ) Greater omentum
(e) End to-end axial anastomosis
(f) Closure of gaps in mesocolon and omentum
(g) Caecostomy

(3) *Splenic flexure and descending colon:*

Steps. (a) Incision: (α) 6" long oblique:
: Below and parallel to costal margin

or (β) Tip of 11th rib to outer border of rectus
Parallel to intercostal nerve

(b) Mobilisation By division of
(α) Ext peritoneal reflection
(β) Costo-colic ligament
(γ) Left gastro colic ligament

(c) Resection of
(α) All intestine supplied by left colic artery
(β) Mesentery
(γ) Lymph drainage

(d) Restoration of continuity by
(α) End to end } anastomosis of { (a) Transverse colon
or (β) Lateral } { (b) Upper sigmoid

(e) Proximal drainage Cæcostomy
(f) Local peritoneal drainage

(4) *Sigmoid flexure or iliac colon*

Tech (i) Two stage
(a) Cæcostomy
↓ (b) Excision + anastomosis
(α) Preliminary mobilisation
(β) Resection
(γ) End to-end anastomosis
(δ) Peritoneal drainage

Points (a) Cut the bowel 45° to the transverse diameter
(b) Do not under run any vessels
(c) Protect the anastomosis by appendices
(d) Rectal tube

(ii) Paul-Mikulicz (See above)

(5) *Pelvic colon*

Steps (1) Anæsthesia spinal + general
(2) Position high Trendelenburg
(3) Incision Left paramedian subumbilical
(4) Exploration and examination of growth
(5) Colo-parietal mobilisation
(6) Ligature of inferior mesenteric artery
Below the first sigmoid branch
Above the lower sigmoid branches
(7) Division of
(a) Mesentery
(b) Colon 3" both ways
(8) Restoration of continuity by anastomosis
(a) End-to-end if lower end accessible
(b) Invagination over rectal tube
If lower end inaccessible
↓ (c) Stretching of the anal sphincter
or (c) Passage of a rectal tube
or (8) Left inguinal permanent colostomy
+ (a) Removal of rectum and anus
or (b) Closure of the lower end

(6) *Pelvi rectal junction*
Tech (1) Abdomino-perineal excision of rectum
(2) Abdomino anal excision
(3) Intra peritoneal excision of the rectum
(4) Rutherford Morison
(a) Transverse colostomy
↓ (b) Excision
↓ (c) End to-end union over a wide tube
(7) *Whole colon*
Ind (a) Severe and intractable colitis
(b) Hirschsprung
(c) Polyposis coli
Tech (1) Complete colectomy
↓ (2) End to-end anastomosis
Between ileum and pelvic colon
Over rectal tube

(K) EMERGENCY OPERATIONS ON INTESTINES

(I) RUPTURE OR PERFORATION

Clinic (a) History of etiology
(b) Shock
(c) Acute perforative abdomen
Special (d) **Localised tenderness**
Pre oper (1) Anti shock
(2) *Keep the suspected part most dependant*
Anæsth Local, *spinal*, general
Operation (1) **Incision** ·
(a) Right paramedian
or (b) Upper midline
(2) **Note:**
? (a) Escape of gas
(b) Escape of bile stained fluid
(c) Escape of fæcal fluid
(3) **Explore** · (Do not allow prolapse)
(a) Local suspected area
or (b) General
(α) Duodeno jejunal flexure
(β) Jejunum
(γ) Ileum (near cæcum)
(δ) Colon
(4) **Treat the focus**
(a) **Isolate** By clamps and packs
↓ (b) **Close** the perforation
(α) Purse string small holes
(β) Transverse suture big holes
↓ (c) Reinforce by an omental patch
or (d) Excise · If blood supply endangered

(5) **Search for other foci**
(6) Search for other injuries
(7) Peritoneal toilet
(8) **Suprapubic drain:**
: (Not necessary in early cases)
(9) Proximal intestinal drainage:
Ind: (*a*) Leakable closure
(*b*) Retro peritoneal wounds

(2) ACUTE INTESTINAL OBSTRUCTION:

Pre oper: (*a*) *Stomach or gastro-duodenal suction*
(*b*) Low turpentine enemata:
. Two enema diagnosis
(*c*) Anti shock measures:
: *Glucose-saline*, warmth, morphia
(*d*) Intravenous. iso or hypertonic saline glucose
(*e*) Anti gas gangrene serum

Anæsthesia: (1) **Spinal**
(2) Local
(3) General:
. *Never forget to pass and keep in stomach tube*

Steps: (1) **Incision:**
: Right paramedian para-umbilical
(2) **Exploration:**
(*a*) *Cæcum.*
(α) Distended.
: No exploration
: Do cæcostomy
(β) Collapsed: explore further
(*b*) Last foot of ileum
(*c*) Pelvis
(*d*) Hernial rings
(*e*) Umbilicus
(*f*) Intestines:
: Follow.
(α) *Empty coils proximally*
or (β) Distended coils distally
(3) **Treatment:**
(A) *Case very late + condition serious.*
: **Temporary intestinal drainage:**
: Of first available loop
(B) *Cæcum distended:*
: Cæcostomy and closure
(C) *Failure of search:*

(1) **If no gangrene:**
- (*a*) Trocar-decompression
- *or* (*b*) Enterostomy : temporary
- *or* (*c*) Short circuit :
  : Distended with collapsed

(2) **If gangrene:**
- (*a*) Exteriorisation :
  : With proximal drain
- *or* (*b*) Excision :
  : With both limbs drain

(D) *Cause found:*

(1) **If removable:**
- (*a*) Remove the cause
- *or* (*b*) Removal of the cause
  + Intestinal drainage

(2) **If irremovable:**
- (*a*) Short circuit
- *or* (*b*) Permanent proximal drain

(E) *Site of the focus:*

(1) **If below the cæcum:**
- (*a*) Cæcostomy
- or (*a*) Transverse colostomy
- + (*b*) *No treatment of primary*

(2) **If above the cæcum:**
Treat the primary cause
- (α) Without intestinal drain
- *or* (β) With intestinal drain

(F) *Stage of the disease:*

(1) **No gangrene:**
- (*a*) General condition bad.
  . Intestinal drainage only
- (*b*) General condition good.
  - (α) Early cases
    Remove the cause
  - (β) Late cases
    Remove the cause
    + Intestinal drain

(2) **Gangrene present:**
- (*a*) General condition serious:
  - (α) Exteriorisation
  - + (β) Prox. intest. drain
- (*b*) General condition bad:
  - (α) Resection
  - + (β) Drainage of loop ends

(c) General condition good
Resection + anastomosis
(α) Without prox drain
(β) With proximal drain

Post treat (1) Nothing by mouth + *oral hygiene*
(2) *Hydrotherapy* glucose saline
(a) Oral
(b) Rectal drip
(c) Intravenous drip
(d) Subcutaneous
(3) *Gastro duodenal suction drain*
(4) Peristalsis stimulators
(A) Rest view
Morphine in small doses
(B) Stimulation view
(a) Pituitrin ½ c.c. subcutaneously
Not repeated more than twice
(b) Prostigmine 1–4000
1 c.c. every 4 hours
(c) Eserine
(d) *Acetyl choline*
(e) Radiant heat to abdomen
↓ (5) Rectal (a) Flatus tube
(b) Turpentine enema
(c) Ox bile enema
15–30 min after stimulator inject

(L) POST OPERATIVE TREATMENT
(1) **Diet** Nearer the operation to the anus sooner may dietary be increased
1st day sips of hot water
2nd day milk two hourly
3rd day bread custard broth
4th day bread butter eggs
5th day fish
10th day full diet
(2) **Bowels**
(a) Small enema on 4th day
If operation on small intestines
(b) No aperient by mouth
For ten days
(3) **Wound**
(a) Non septic dry dressings
(b) Fistulæ
Skin protection with frequent dressings

(M) POST OPERATIVE COMPLICATIONS.

(1) **Paralytic ileus:**
Etio: (a) Continuation of pre operative condition
(b) Operative trauma and exposure
(c) Toxæmia
(d) Stimulation of peristalsis.
Too early and prolonged

(2) **Peritonitis:**
Etio (a) Continuation of pre operative condition
(b) Leaving in untreated focus
(c) Operative soiling of the peritoneum
(d) Post operative leak through anastomosis

(3) **Burst abdomen:**
Etio (a) Access of digestive juices to the wound
(b) Faulty sutures
(c) Straining

(4) **Fæcal fistula:**
Etio (a) Perforation or gangrene
↓ (b) Peri intestinal accumulation
↓ (c) Bursting
(α) Through the operative wound
or (β) Through abscess drainage

(5) **Wound infection:**
Diffuse cellulitis of the abdominal wall.
(a) Non specific
(b) Gas gangrene

(6) **Chest complications:**
(a) *Aspiration pneumonia*
Etio (α) General anæsthesia
(β) Leaving out pre operative stomach wash
(b) Collapse of the lung

(7) **Septic parotitis**

(8) **Toxæmia:** Intestinal, urinary, metabolic

(9) **Sequelæ:**
(a) Adhesions → intestinal obstruction
(b) Stricture → " "
(c) Ventral hernia

IMPORTANT POINTS

(1) *In a case of imperforate anus, do left inguinal colostomy if aspiration is unsuccessful at a depth of half an inch.*

(2) Congenital causes of acute intestinal obstruction:
(a) *Imperforate anus*
(b) Occlusion of the ileum
(c) Occlusion of the duodenum

(*d*) Volvulus neonatorum
(*e*) Strangulated umbilical hernia
(*f*) *Exomphalos*

(3) Diseases requiring massive intestinal resections
(*a*) Volvulus of the small intestine with gangrene
(*b*) Mesenteric thrombosis with gangrene
(*c*) Strangulated hernia with gangrene

(4) Melæna may be the only symptom of ulceration of Meckel's diverticulum especially in children

(5) Meckel's diverticulum clinical syndrome
(*a*) Catarrhal inflammation pseudo appendicitis
(*b*) Acute intestinal obstruction
(*c*) Peptic ulceration melæna in children
(*d*) Intussusception

(6) *In every case of 'appendicitis' with no appendicular morbidity, do not forget to look for Meckel s diverticulum*

(7) *Stab wound of the abdomen*
(*a*) *Explore every case*
(*b*) *Length of the wound is no criterion of the depth*
(*c*) *Probing is worse than useless*
(*d*) *Suture the perforation at right angles to the long axis of the intestine*

(8) Suture of gunshot injuries of the intestines is preferable to resection

(9) Clinical forms of diverticulitis
(*a*) Inflammatory
(*b*) Obstructive
(*c*) Carcinomatous
(*d*) Fistulous (α) External
(β) Internal

(10) Perforation and stricture are the common complications of any ulcer of the colon.

(11) Think of Crohn's regional ileitis in all cases of appendicitis of some duration

(12) The permanent cure of extensive, intractable, chronic ulcerative colitis demands complete removal of diseased bowel

(13) Crohn's disease
(*a*) Young adult
\+ (*b*) Low grade inflammation
\+ (*c*) Partial intestinal obstruction

(14) *In tuberculous intestine, remember that strictures are multiple*, short circuit should be performed proximal to the highest stricture.

(15) Chronic appendicitis syndrome in a young anæmic female especially Mohamedan ? T B cæcum

(16) In typhoid abdomen
  (a) Signs of peritonitis may be masked by toxæmia
  (b) Typhoid tympanitis may mask perforative peritonitis
  (c) *Sudden shock in typhoid.*
    (α) *? Hæmorrhage*
    (β) *? Perforation*

(17) *Think of typhoid in any abdominal emergency from a typhoid area*

(18) In ambulatory typhoid, hæmorrhage or perforation may be the first sign of the disease

(19) *Most common causes of intestinal fistulæ*
  (a) *Appendicitis post operative*
  (b) *T B intestines*
  (c) *Carcinoma*

(20) Fæcal odour does not mean fæcal fistula

(21) Anomalous syndrome of carcinoma colon
  (a) Pseudo appendicitis
  (b) Tuberculous abscess
  (c) Colitis with spasm
  (d) Megacolon
  (e) Gall stone colic
  (f) Cystitis.

(22) Only a small minority in whom a polyp can be seen with sigmoidoscope have diffuse polyposis

(23) 70% of all surgical procedures for colon disease are performed for new growths, the vast majority of which are malignant.

(24) In patients with increasing constipation, colic and melæna carcinoma colon *must be the diagnosis until proved otherwise*, even if the sigmoidoscope and the X rays fail to reveal it.

(25) In carcinoma colon, actual size of the tumour bears an inverse relationship to its malignancy

(26) *Only definite contra indications for radical removal of* carcinoma colon are
  (a) Secondaries in liver
  (b) Ascitis
  (c) Secondaries in pelvis.

(27) Growths of the left colon are obstructive, growths of the right colon are rarely obstructive, but lead to early cachexia.

(28) *Diagnosis of carcinoma colon is best made by a continual remembrance of its possibility in a middle-aged person with any alteration in the bowel habit*

(29) *In carcinoma colon*, cæcum bears the brunt of the obstruction, and so *the obstructive or inflammatory signs are most marked in right iliac fossa*

(30) *Carcinoma colon may occur in quite young people*

(31) *Cachexia may be absent till the last in carcinoma of the left colon*

(32) *In excision of the intestines for carcinoma, there are two guiding principles* (a) *Lymph drainage*
(b) *Blood supply*

(33) Total mortality of acute intestinal obstruction is 40%

(34) In intestinal obstruction the classical picture of any abdominal emergency is the herald of impending death

(35) *External strangulated hernia is the most common single cause of acute intestinal obstruction*

(36) Five most common causes of acute intestinal obstruction
(a) *Strangulated external hernia*
(b) *Volvulus*
(c) Internal strangulation
(d) Carcinoma
(e) Adhesions

(37) In carcinoma colon
(A) A transition upwards is noted from right to left in four features
(a) Average duration of symp oms
(b) Constipation and colic
(c) Diarrhœa
(d) Macroscopic bleeding
(B) A transition downwards is noted from right to left in following four features
(a) Anæmia
(b) Indigestion
(c) Localised pain
(d) Palpable tumour

(38) *Strangulation without complete obstruction*
? *Richter s hernia*
? *Strangulated omentum*

(39) Death within a few hours may follow rapid decompression of distended gut by operation

(40) Chief causes of death in small gut obstruction
(a) Peritonism
(b) Dehydration
(c) Toxæmia

(41) *Nervous shock and peritonitis are the chief causes of death in strangulation* bacterial toxæmia plays a secondary part

(42) Liquid fæces may be passed once after the onset of mechanical obstruction of the small intestine but after that there is absolute constipation.

(43) Main causes of intestinal obstruction

(A) Congenital

Imperforate anus

(B) Early life

(a) Strangulated hernia
(b) *Intussusception*
(c) Bands
(d) Meckel

(C) Middle life

(a) *Strangulated hernia*
(b) *Adhesions and bands*
(c) Carcinoma
(d) *Volvulus*

(D) Late life

(a) *Carcinoma*
(b) *Strangulated hernia*
(c) Fæcal impaction
(d) Volvulus
(e) Intussusception

(E) Post operative or post peritonitic

(a) Paralytic ileus
(b) Adhesions and bands.

(44) Intestinal obstruction with abdominal scar
? Post operative adhesions.

(45) In simple intestinal obstruction, death is due to dehydration by (a) Vomiting
(b) Loss of fluid in the bowel lumen

(46) In strangulation death is due to
(a) Nervous shock
(b) Dehydration
(c) Toxæmia.

(47) *Early and still earlier operation, after*
(a) *Intravenous saline*
(b) *Spinal anæsthesia*
(c) *Gastro-duodenal suction*
Is the key to success in acute intestinal obstruction

(48) *Sudden deflation of dilated intestine has been the effective cause of death due to collapse and toxæmia*

(49) *Fundamental symptoms and signs of acute intestinal obstruction*
(a) *Pain*
(b) *Vomiting* } *Peritonism triad*
(c) *Shock*

(d) *Copro stasis*
(e) *Distension*

(50) *Griping pains* not relieved by ordinary measures constitute the outstanding symptom of all mechanical intestinal obstructions.

(51) *Persistent regurgitant vomiting* is one of the most constant symptoms of intestinal obstruction
(a) Early and marked in small gut
(b) Late and insignificant in large gut

(52) Persistent vomiting in acute intestinal obstruction may be absent in
(a) Starvation post operative ileus
(b) Low large gut obstruction
(c) Partial obstruction Richter

(53) History of *arrest of flatus* is of real importance in acute intestinal obstruction

(54) '*Two diagnostic enemata*' are valuable in the diagnosis of intestinal obstruction
No fæces or flatus with the second enema

(55) *Visible peristalsis* accompanied by colicky pain is pathognomonic of acute on chronic obstruction

(56) *Distended and gurgling cæcum* is a prominent sign in large gut obstructions

(57) Never omit *rectal or vaginal examination* in every case of intestinal obstruction

(58) *Abdominal tenderness and rigidity are absent in acute intestinal obstruction, unless peritonitis supervenes*

(59) Never omit *abdominal auscultation* in every case of intestinal obstruction
(a) Mechanical obstruction borborygmi
(b) Paralytic ileus dead silence

(60) Ephedrine is best avoided in intestinal obstruction.

(61) Certain cases of small gut obstruction without strangulation can be saved without operation by duodenal tube siphonage.

(62) Gastro duodenal suction decompression does not avail beyond ileo cæcal valve

(63) *In the treatment of acute intestinal obstruction, gradual decompression is the key note of success*
(a) *Small gut obstruction*
Induelling duodenal tube suction
(b) *Large gut obstruction*
Wangensteen transverse colostomy

(64) *Best means of releasing the distension and consequent stagnation of circulation in the bowel wall are*

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Wangensteen transverse colostomy

(64) *Best means of releasing the distension and consequent stagnation of circulation in the bowel wall are*

(a) *Duodenal tube suction-decompression*
(b) *Intravenous hypertonic saline*
(c) *Liberal use of morphia*

(65) A good test for restoration of chlorides in acute vomiting is to add a drop of silver nitrate to urine which gives white precipitate.

(66) *Simple glucose* stimulates urinary salt excretions and so *should not be given, unless combined with saline, in acute intestinal obstruction*

(67) 70% of ileal obstructions are associated with strangulation

(68) *Hypertonic intravenous saline stimulates peristalsis and is therefore contra indicated in unrelieved mechanical obstructions* unless there is proximal enterostomy

(69) 95% of internal strangulations affect the small intestines, the lower part of the ileum being the common site

(70) *Palliative treatment is indicated for*
(a) *High small gut obstruction*
(b) *Large gut obstruction*

(71) *Immediate surgery is indicated for*
(a) *Low small gut obstruction*
(b) *Strangulation*

(72) *In acute intestinal obstruction, whatever the treatment, there must be proximal external drainage*

(73) Traumatic shock and peritonitis are the chief accompaniments *of strangulation and early diagnosis with timely* operative interference is the only treatment

(74) In acute abdomen operations
(a) Get in quick and get out quicker
(b) Do the minimum consistent with ultimate recovery

(75) [illegible]

(c) Pre operative } any intestinal obstruction
(d) Post operative }

(2) *Enterostomy*.
Ind (a) Low small gut obstruction
(b) No strangulation left in
(c) Cause (α) Dealt with (additional)
(β) Left alone (palliative) (preliminary)

(3) *Caecostomy or transverse colostomy*
Ind Large gut obstruction

(76) *After treatment of intestinal obstruction operations*
(a) *Gastro-duodenal suction tube*
(b) *Intravenous glucose saline*

(c) *Peristalsis promoters :*
(α) *Morphia*
(β) *Acetyl choline*
(γ) *Ox bile enema*
(δ) *Hypertonic saline.*

(77) Intermittent colicky pain with interval pallor in healthy male infants:
? Intussusception

(78) Intussusception in adolescent life denotes inverted Meckel's diverticulum, that in old life denotes carcinoma, in infants it is idiopathic.

(79) Copious bright red hæmorrhage with no mucus and no lump in abdomen or on rectal examination:
: Suspect typhoid more than intussusception

(80) Intussusception of infants is not primarily an obstruction; the early picture is one of recurrent colic and mesenteric shock.

(81) Intussusception of adults behaves like ordinary intestinal obstruction.

(82) The treatment of acute intussusception is early and speedy operation

(83) Methods of reduction of intussusception:
(A) *Conservative :*
(a) Hydrostatic
(b) Barium
}: enema
(B) *Operative* ·
(a) Manual milking
(b) Cope's finger method
(c) Daw's forceps method
(d) Brown's incision method.

(84) Prognosis in intussusception varies inversely with the time that the infant is on the operation table under general anæsthesia. With spinal, it does not matter much.

(85) In intussusception, any of the devices to shorten the mesentery or anchor the cæcum are useless unless recurrence occurs

(86) In children, leave out many tailed abdominal bandage after laparotomies; elastoplast dressings are all that is required.

(87) Differential diagnosis between prolapse rectum and intussusception:
(a) Rectal prolapse.
: Continuous with anal skin
(b) Intussusception:
: Sulcus between the protrusion and anal margin.

(88) Chocolate coloured fluid in the peritoneum
? Strangulation
? Malignancy

(89) Ballooning of the rectum is a sign of low colon obstruction

(90) *Never allow prolapse of distended intestines outside the abdomen, as it leads to fatal collapse*

(91) Drain the abdomen in all cases of volvulus.

(92) Special signs of sigmoid volvulus
(a) Tenesmus
(b) Distension + +
(c) Inability to pass an enema or rectal tube
(d) Ballooned rectum

(93) *Every case of acute small gut obstruction in a robust adult, think of volvulus*

(94) [illegible]

(95) All raw areas in abdomen must be covered by peritoneum, to avoid adhesions.

(96) Intraperitoneal strangulation reveals itself by
(a) Blood stained peritoneal exudation
(b) Blue black colour

(97) Special diseases of the ileum
(a) Congenital (α) Meckel
(β) Atresia
(b) Inflammations (α) Typhoid
(β) Tuberculosis
(γ) Regional ileitis
(c) Intussusception
(d) Volvulus
(e) Impactions F B or gall stone
(f) Adhesions appendix, salpinx

(98) Signs of obstruction due to stricture appear earlier in large than in small gut, due to solid nature of contents

(99) Special features of strangulation
(a) Sudden onset and extremely acute course
(b) Severe pain + shock
(c) Early toxæmia
(d) Tenderness + rigidity
(e) Blood in peritoneum + per anum

(100) Bloody discharge in peritoneum
(a) Carcinoma
(b) Strangulation bands volvulus, intussusception, hernia, mesenteric thrombosis
(c) Acute pancreatitis

(*d*) Intraperitoneal hæmorrhage
(*e*) Streptococcal peritonitis

(101) Mesenteric embolism
Sudden very acute intestinal obstruction with internal hæmorrhage (*a*) Blood in peritoneum
(*b*) Blood per anum
(*c*) Hæmatemesis.

(102) Remove the mesentery along with the gangrenous gut in mesenteric embolism

(103) *Beware of cases which feel 'too well' after acute laparotomies, delayed shock may lead to sudden unexpected collapse or patient may be too toxic*

(104) *Intestinal decompression as far as ileo cæcal junction can be nicely done by indwelling gastro duodenal tube with suction drainage*

(105) Cause of gangrene of the gut is cutting off of the blood supply due to
(*a*) Strangulation
(*b*) Trauma to or ligature of the blood vessel
(*c*) Mesenteric thrombosis

(106) If liquid paraffin injected by a catheter into an intestinal fistula, does not appear per rectum, diagnose distal obstruction

(107) Most important factors in abnormal anus
(*a*) Spur
(*b*) Distal obstruction
(*c*) Persistent infection
(*d*) Malignancy

(108) *Do not take McBurney incision for appendicectomy in children*, as the appendix may lie high up

(109) Lesser curve below the level of umbilicus
Entero ptosis

(110) *In foreign bodies*
(*a*) *Never give a purge*
(*b*) *Examine every stool passed*
(*c*) *Follow with X Ray screen daily*

(111) Think of diverticulitis in elderly people with left iliac trouble.

(112) *Think of typhoid in every emergency abdomen*

(113) Carcinoma colon
(*a*) Sometimes occurs in young people
(*b*) Common sites rectum, sigmoid, cæcum
(*c*) Signs in right iliac fossa
(*d*) Cachexia may be absent till late.

(114) *Acute intestinal obstruction*

(A) { ? Mechanical
? Paralytic (α) Primary
(β) Secondary

(B) { ? High small gut
? Low small gut
? Large gut

(a) *Never forget to aspirate the stomach before operation*
(b) *Spinal anaesthesia is best*
(c) *Caecum is the first and most important landmark in exploration*

(115) Think of intussusception in every case of 'dysentery'

(116) Acute intestinal obstruction (small gut) in adults
? Volvulus ileum

(117) Acute intestinal obstruction (large gut) in seniles
? Volvulus sigmoid
? Carcinoma colon

(118) Extreme distension is pathognomonic of
(a) Sigmoid volvulus
(b) Paralytic ileus.

(119) *Never forget ileus verminosus in children, think of worms in every acute or chronic abdomen in children, never operate on a chronic abdomen in children, without giving two preliminary doses of santonin and excluding worms*

(120) Intestinal obstruction in old
(A) Acute
Volvulus
(B) Acute on-chronic
(a) Carcinoma
(b) Diverticulitis
(c) Faecal impaction

(121) *Rigid and long kept rubber drain*
(a) *Paralytic ileus*
(b) *Faecal fistula*
(c) *Secondary haemorrhage*
(d) *Ventral hernia*

(122) *The most important single symptom in acute intestinal obstruction is inability to pass flatus*

(123) Treatment of paralytic ileus should not be curative but must be preventive by
(a) Minimising operative trauma
(b) Early treatment of peritoneal infection.

(124) *Causes of post-operative obstruction*
(a) *Anal spasm* meteorism

(b) *Paralytic ileus:*
 (α) Nervous
 (β) Mechanical: muscular exhaustion
 (γ) Toxic: peritonitis
(c) *Mechanical:* torsions, adhesions, strictures.

(125) For the common post operative meteorism without a true ileus, spasm of the anal sphincter is responsible and so, *anal stretching must be a routine after every laparotomy.*

(126) Dead silence on auscultation over abdomen:
? Paralytic ileus

(127) Violent borborygmi on auscultation over abdomen:
: Mechanical obstruction.

(128) *Drastic catharsis, anal spasm and prolonged peritoneal drainage tube are very common causes of post operative paralytic ileus,* and can be easily avoided.

(129) Unavoidable causes of post operative paralytic ileus are:
(a) Peritonitis
(b) Operative trauma
(c) Mental shock.

(130) *Spinal anæsthesia is best in abdominal surgery:*
(a) *Muscular relaxation*
(b) *Peristalsis stimulation*

(131) Post operative obstruction appearing within first three days is paralytic, after the fourth day, it is mechanical.

(132) Pituitrin and eserine produce only local spasms in small intestines and produce after-relaxation Pituitrin is of value only in colonic stasis

(133) *Without saline or insulin, glucose has depressing effect on intestinal peristalsis*

(134) If during injection of hypertonic saline, colicky pains occur without passage of flatus or fæces, diagnose mechanical obstruction

(135) *Spinal anæsthesia for paralytic ileus, should never be postponed beyond the end of second day and should invariably follow hypertonic saline and enemata in sequence.*

(136) *Ephedrine must never be given after spinal anæsthesia, as it nullifies the effect of the spinal on peristalsis;* intravenous saline may be given instead.

(137) *In obscure cases of paralytic ileus, remember:*
(a) *Uræmia*
(b) *Typhoid*
(c) *Spinal disease*

(138) Summary of treatment for post operative obstruction:
(A) *First 24 hours:*
(1) [illegible]

(2) Intravenous glucose saline
(3) Gastro duodenal suction drainage:
(a) Nasal route
(b) Oral route
(4) Anal stretching or flatus tube
(5) Morphia: 1/6 gr. 6 hourly

(B) *At the end of first 24 hours:*
(1) Ox-bile enema: 6 ounces
↓ (2) Turpentine enema

(C) *24 hours to 36 hours:*
(1) Intravenous saline
(2) Gastro duodenal suction
(3) Heat to abdomen
(4) Morphia. 1/6 gr 6 hourly

(D) *36 hours to 48 hours:*
(1) (a) Hypertonic intravenous saline:
: 500 c.cs., 10%
↓ (b) Ox-bile enema
↓ (c) Turpentine enema
(2) Acetyl choline: ·1 gm. hourly for 6 doses

(E) *End of 48 hours:*
(1) Spinal anæsthesia
↓ (2) Operative measures
(a) Cæcostomy
(b) Enterostomy
(c) Short circuit:
. Jejuno transversostomy.

(139) Paul's tube is better than a catheter in cæcostomy.

(140) Chief indications for colostomy:
(a) Carcinoma
(b) Ulceration
(c) Fibrosis
(d) Fistulæ
(e) Volvulus
(f) Obstructions
(g) Anastomosis.

(141) If colon cannot be found on exploration, inject water per anum.

(142) Immediate opening of a colostomy is better than delayed; it is safe and spares pain and agony to the patient.

(143) Important rules for intestinal anastomosis:
(a) No intestinal anastomosis must be done in the presence of established obstruction
(b) *Never anastomose the intestine which cannot be exteriorised*

(c) Never allow the suture line to be flooded with intestinal contents
(d) Never allow peritoneal soiling
(e) Never do anastomosis of a portion whose mesentery is not healthy
(f) *Take extreme care to see that suture line is not devascularised*
(g) No tension on suture line
(h) When in doubt, *do proximal intestinal drainage*

(144) When gangrene of the intestine is limited and annular, it is safer to invaginate than resect

(145) Indications for intestinal exclusion or short circuit
(a) Intestinal obstructions growth or fibrosis
(b) Fæcal fistulæ
(c) Colonic stasis

(146) In operations for fæcal fistula
(a) Simple short circuit is useless
(b) Unilateral complete exclusion is ineffective
(c) Bilateral complete exclusion is necessary

(147) In choosing a site for anastomosis to restore continuity, avoid long blind ends, as they are undrained cul de sacs and may lead to (a) Stasis
(b) Distension and perforation
Of the proximal blind end
Due to vis a tergo

(148) *Colon carcinoma* (virulence)
(a) *Colloid is most malignant*
(b) Ring stricture is midway
(c) *Fungating is least malignant*

(149) Frequent sites of carcinoma colon
(a) Pelvic and iliac 48%
(b) Cæcum 15%
(c) Splenic flexure 10%
(d) Transverse and ascending 9%
(e) Descending 6%.

(150) Types of growth in carcinoma colon
(a) Tubular stricture
(b) Infiltrating ulcer
(c) Ring stricture
(d) Papillomatous.

(151) In every case of colectomy and anastomosis proximal drainage either as a preliminary or as an additional measure, is invaluable as a safety valve.

(152) In cases of obstruction, it is unjustifiable to attempt a radical cure in one stage, first step is to relieve the obstruction

(153) *Additional cæcostomy is a great safeguard in all colon anastomosis, so also drainage from near about the suture line*

(154) Essentials for successful colon anastomosis:
- (a) Adequate exposure
- (b) Thorough mobilisation
- (c) Adequate blood supply
- (d) No tension
- (e) Protection to suture line with drainage upto it
- (f) Proximal bowel drainage or rectal tube.

(155) *The usual cause of disaster after colectomy with anastomosis is leakage at the suture line* in the following few days due to a patch of gangrene. *It is of utmost importance to be sure of the blood supply of the colon ends*

(156) Paul's colectomy
- (a) Mobilisation
- ↓ (b) Exteriorisation of the loop
- ↓ (c) Basal lateral union of limbs of the loop: With or without apex drain
- ↓ (d) Excision
  - (α) Immediate
  - (β) Delayed
- ↓ (e) Enterotome application to the spur
- ↓ (f) Closure of the fistula

(157) Drawbacks of Paul-Mikulicz
- (a) Not suitable for immobile parts
- (b) Partial removal of lymph area

(158) Best methods of colon resection and anastomosis.
- (A) Multi staged operation
  - (a) Proximal drainage
  - ↓ (b) Resection → anastomosis
  - ↓ (c) Closure of the proximal drain
- *or* (B) Extra peritoneal anastomosis of Paul Mikulicz
- \+ (C) Proximal intestinal drainage or rectal tube.

(159) *Methods of combating toxæmia in intestinal obstruction:*
- (a) *Saline infusions*
- (b) *Gastro-duodenal suction drain*
- (c) *Anti gas gangrene serum*
- (d) *Bile vomit returned per rectum*

(160) *Transverse colostomy as an artificial anus is second to none for comfort and control,* and is equally good in cases of large gut obtructions as is cæcostomy. It is superior to the latter in that it may serve both purposes: temporary and permanent. The contents are more solid than those of cæcum while more fluid than those of sigmoid

(161) Blind left inguinal colostomy without exploration is indicated in:

(a) Carcinoma of pelvic colon
(b) Acute or chronic obstruction due to
Inoperable carcinoma rectum
(c) Imperforate anus with negative aspiration

(162) Before putting in a Paul's tube in colostomies, isolate the loop by 'hole in the vaseline pad' method Tape is most useful for keeping a Paul's tube firmly in position

(163) Always protect a laparotomy wound from colostomy by 'adhesive plaster watershed

(164) Rectal causes of acute intestinal obstruction
(a) *Carcinoma*
(b) Simple stricture
(c) Foreign body
(d) Impaction of fæces
(e) *Imperforate anus*

(165) A dessert spoon is very useful in the removal of foreign body or impacted fæces from rectum

(166) '*Dangerous*' *area leakage area*
The little triangle at the junction of the gut and its mesentery

(167) *In closing a gap in the mesentery, do not use a needle, tie ligatures over hæmostats on each margin*

(168) Intestinal obstruction due to appendix
(1) Primary appendix acting as a band
(2) Secondary post operative
(A) *Within first 3 days*
Cause Paralytic ileus
(B) *Between 6–10 days*
Cause Bands and adhesions
Clinic Colic + Vomit
Treat Re-exploration
(C) *Between 10–21 days*
Cause Pelvic peritonitis
Treat Ileo transversostomy
(D) *After 90 days*
Cause Adhesions bands ventral hernia
Treat Re exploration
↓ Removal of the cause
or Short circuit
(E) *Post-operative any period*
Cause Functional
Clinic Constipation
Treat Laxatives

(169) Acute intestinal obstruction + mitral stenosis or endocarditis = mesenteric embolism → operate immediately

(170) Valvular cæcostomy as the last stage in an operation for carcinoma colon, is now routine and an important factor in decreasing the post operative risks.

(171) *First worry of the surgeon after laparotomy for acute obstructive lesions is paralytic ileus, the second worry is peritonitis*

(172) The first inquiry at the time of first post operative visit to the patient will be about his bowel action, if a laparotomy has been done

? Has he passed fæces
? Has he passed flatus
? Does he feel any intestinal movements
? Is there any distension
? Is there any vomiting

(173) *The great question after an urgent laparotomy.*
Is the patient heading towards paralytic ileus? If he is, remember that prophylaxis is better than cure, earlier the combating measures are started the better for every body concerned

(174) In a case of Meckel s diverticulectomy, use unabsorbable sutures for serous coat, as sometimes ferments may digest catgut sutures, or best is to resect the parent iliac segment

(175) Treatment of skin excoriation in fæcal fistula
(*a*) Kaolin paste kaolin + glycerin
(*b*) Suction
(*c*) Protein two catheters
(α) Hydrochloric acid into intestine
(β) Peptone or beef broth on the skin
(*d*) Yeast

CHAPTER VI

THE APPENDIX

(I) APPENDICITIS:

Incidence: (*a*) **Age**: (α) Rising from birth to 15
(β) *Maximum from 15 to 30*
(γ) Declining from 30 to 45
(δ) Uncommon after 45
(*b*) **Sex**: Males > females
(*c*) **Race**: Europeans > Asiatics
(*d*) **Heredity** and familial
(*e*) **Diet**: (α) Non vegetarian
(β) Fat and fatty acids
(γ) Cellulose deficiency
(*f*) **Constipation** and purgation

Predisp: **Anatomical peculiarities**:
(*a*) **Shape**: Closed, kinked, strictured cul de sac
(*b*) **Contents**: Fæcoliths, worms
(*c*) **Structure**: Lymphoid
(*d*) **Blood supply**: Short appendicular art
(*e*) **Function**: Stasis

Path: (A) *Acute appendicitis*
(1) *Appendicitis proper*.
(*a*) **Inflammatory**:
Morb. anat. (α) Catarrh
↓ (β) Suppuration
↓ (γ) Ulceration
↓ (δ) Perforation
(*b*) **Obstructive**:
Causes: (α) Stricture
or (β) Fæcolith
or (γ) Kink
Morb. anat: (1) Mucocele
↓ (2) Empyema
↓ (3) Perforation
or (4) Ileus
(*c*) **Circulatory**:
Morb. anat: (α) Thrombosis of appendicular art.
↓ (β) Gangrene
(2) *Appendicular peritonitis*:
Causes: (*a*) Transmigration of bacilli

(b) Perforation: at the
(α) Tip
(β) Hiatus muscularis

Varieties: (a) **Right iliac peritonitis:**
↓ Right iliac peritoneal abscess
Pus surrounded by a wall composed of intestines, *omentum*, adhesions

(b) **Pelvic peritonitis:**
↓ Pelvic abscess
Causes: (α) Primary: pelvic appendix
(β) Secondary
: To right iliac abscess

↓ (c) **Spreading general peritonitis:**
Causes. (α) Primary: ileal appendix
(β) Secondary:
↓ (1) Right iliac abscess
↓ (2) Pelvic abscess
↓ (3) Left iliac abscess
↓ (4) General peritonitis

(d) **Retro-peritonitis:**
↓ Retro peritoneal abscess
Cause: Retro cæcal appendix

(3) *Appendicular intestinal obstruction:*
(a) **Primary:** Appendix acting as a band
(b) **Secondary:** Due to
(α) Inflammatory adhesions
(β) Paralytic ileus

(B) *Chronic appendicitis*
(1) **Hyperplastic lymphoid:**
Clinic: Appendicular dyspepsia
(2) **Fibrous:**
Causes: (a) Adhesions
(b) Strictures
(c) Kinks
Clinic: (α) Shrivelled harmless appendix
(β) Chronic obstructive appendix
(3) **Hyperplasia + fibrosis:**
Clinic. Appendicular mass

(C) *Secondary appendicitis.*
(1) As a part of general peritonitis
(2) Implication in the inflammation of neighbouring viscera. (α) Salpinx
(β) Cæcum

Bacteriology: (a) B. coli
(b) Streptococcus fæcalis

(c) B. Welchii
(d) Aschoff's organism

Clinic: (1) *Acute appendicitis proper:*

Path. varieties: (A) *Inflammatory appendicitis.*

(a) **Peri umbilical or epigastric pain:**
: Sudden and acute, colicky
· Accompanied by.
(α) Nausea and **vomiting**
(β) Peritoneal **shock**

↓ (b) **Right iliac visceral signs:**
(1) Pain right iliac
(2) Hyperæsthesia Sherren's triangle
(3) **Tenderness: McBurney**

↓ (c) **Rising temperature and pulse**

(d) **P.R.:** Tenderness on right side

(B) *Obstructive appendicitis*

Varieties: (a) Obstruction in appendix
(b) Appendix as an obstruction

Clinic: (a) **Peri-umbilical or epigastric pain:**
. Acute, sudden, colicky
. Accompanied by
(α) Nausea and **vomiting**
(β) **Peritoneal shock**

↓ (b) **Low small gut obstruc. syndrome:**
(a) Early and repeated vomits
(b) Colicky attacks
(c) Absolute constipation
(d) Paralytic ileus → distension

Special: (1) No rigidity
(2) No temperature
(3) Hyperæsthesia in Sherren's triangle
(4) Rovsing

(C) *Gangrenous appendicitis*

Etio: (a) Thrombosis
(b) Obstruction

Clinic: (1) **Fulminating course**
(2) **Early loss of pain and rigidity**
(3) **Peritoneal toxæmia:**
: Early and pronounced
(4) La Roque testis retraction
(5) ? Cardio vascular primary lesion

(D) *Appendicular perforation*

Etio: (a) Gangrene
(b) **Tension**
(c) Ulceration

Sites (1) **Tip**
(2) Hiatus muscularis
(3) Over a fæcolith

Clinic: Acute inflam or obstruct appendicitis
↓ (*a*) **Sudden disappearance of:**
(α) Pain
(β) Hyperæsthesia
(γ) Tenderness
+ (*b*) **Peritonism:** Peritoneal shock
(α) Vomit
(β) Falling temperature
(γ) Rising pulse
↓ (*c*) Local peritonitis syndrome
↓ (*d*) Regional peritonitis syndrome
↓ (*e*) **General peritonitis syndrome**

Anatomical variations.

(1) *Retrocaecal*
(*a*) Local signs in **right lumbar** region
(*b*) **Pseudo-urinary signs:**
(α) Ureteral-colic pain
(β) Hæmaturia
(*c*) Baldwin's test *Painful leg-lift*
(*d*) Altschuler test (Med Ann. 1939)
Tender & spastic rt. pelvic margin
(*e*) P R. negative

(2) *Pre ileal*
(*a*) **Medial** local signs
(*b*) Early spreading peritonitis
(*c*) Early and pronounced **ileus**

(3) *Promonteric*
(*a*) **Psoas irritation:**
. Hip flexion & psoas test
(*b*) Ureteral irritation
. Pseudo ureteral colic
(*c*) P.R. right sided tenderness

(4) *Pelvic*.
(*a*) Irritation of **pelvic organs:**
(α) Bladder
(β) Rectum
(γ) Genitals
(*b*) Obturator internus test
(*c*) P R. tenderness
(α) Right sided
(β) Bimanual palpation
(*d*) **Absence of abdominal rigidity**
(*e*) Suprapubic pain

(5) *Mid inguinal:*
  (a) Tenderness } above the **middle**
  (b) Worm like feel } **of Poupart lig.**

(6) *Sub hepatic.*
  (a) Children
  (b) Local signs in **right hypochondrium**

(2) *Acute appendicular peritonitis:*

(A) *Right iliac peritonitis* (Subcæcal appendix)
  (a) Pain
  (b) Hyperæsthesia
  (c) Tenderness
  (d) Immobility
  (e) **Rigidity**
  (f) Loss of muscle reflex
  (g) Mass

↓ *Right iliac abscess*
  (a) History over ten days
  (b) Softening → fluctuating **lump**
  (c) Inflammatory œdema of the skin
  (d) General septic toxæmia
  (e) Leucocytosis > 20000

(B) *Pelvic peritonitis*
  (Promonteric or pelvic appendix)
  (a) Pelvic organs irritation syndrome
  (b) **P.R.**

↓ *Pelvic abscess*
  (a) History of appendicitis over ten days
  (b) **Diarrhoea and proctitis:**
  With mucus per anum
  (c) P R. soft cystic swelling
  (d) General septic toxæmia
  (e) Leucocytosis > 20000
  (f) No abdominal rigidity

(C) *Sub-hepatic peritonitis*
  · (Sub hepatic appendix)
  (a) Children or ascending paracolic appendix
  (b) Pseudo-cholecystitis

↓ *Sub hepatic abscess:*
  (a) Pseudo cholecystitis or hepatitis
  (b) General septic toxæmia
  (c) History over ten days
  (d) Leucocytosis > 20000

(D) *Spreading general peritonitis.*
  : (Pre ileal appendix)
  · All *symptoms and signs of:*

(a) Right iliac peritonitis:
• (Signs more marked)
↓ (b) General peritonitis

(E) *Retro peritonitis*. (Retro-cæcal appendix)
(a) Symptoms and signs of **perinephritis**
(b) Local *signs in the right lumbar region*

↓ *Retro peritoneal abscess*.
Sites (a) Right lumbar abscess
(b) Perinephric abscess
Clinic (1) History more than 10 days
(2) **Local lumbar mass**
(3) Inflammatory œdema
(4) General septic toxæmia
(5) Leucocytosis > 20000

Course of acute attack

(1) **Fulminating:**
Cause Gangrenous appendicitis
Clinic Toxæmic death in 24 hours

(2) **Very acute:**
Causes (a) Perforation
(b) Intestinal obstruction
(c) Rapidly spreading peritonitis
Clinic Rapidly spreading clinical syndrome

(3) **Acute:**
Cause Acute catarrh
Clinic Classical syndrome

(4) **Subacute:**
Cause Subacute catarrh or obstruction
Clinic Subacute signs

(5) **Relapsing:**
Clinic Exacerbation in a settling-down attack

(6) **Recurrent:**
Causes (a) Recurrent catarrh
(b) Recurrent obstruction
Clinic History of multiple acute or subacute attacks with intervals of freedom

(3) *Chronic appendicitis*
(a) Obstructive
: **Recurrent appendicular** *colic*
(b) Hyperplastic
: **Chronic appendicular** *mass*
(c) Degenerative
: **Appendicular** *dyspepsia*

Diff diag (A) *According to the virulence of the course:*
(1) **Fulminating:** (a) Acute fevers
(b) **Acute toxæmias**

(2) **Acute :** (*a*) **Acute abdominal lesions :**
- (1) Gastro duodenal
- (2) Biliary
- (3) Pancreatic
- (4) Intestinal
- (5) Pelvic

(*b*) **Acute colics :**
- (1) Intestinal
- (2) Urinary
- (3) Uteral
- (4) Biliary

(3) **Subacute :** (*a*) Regional inflammations
(*b*) Pelvic inflammations

(4) **Chronic :** (*a*) **Colics**
(*b*) **Dyspepsias :**
- (α) Organic
- (β) Functional

(*c*) Causes of a **local mass :**
- (α) *Tuberculosis*
- (β) Syphilis
- (γ) *Carcinoma*
- (δ) Lymphadenitis

(*d*) Chronic colitis

(B) *According to anatomical structure lesions*
- (1) **Thoracic :** Referred
- (2) Spinal Referred
- (3) Nervous system tabetic crises
- (4) **Genito-urinary :**
  - (*a*) Retro cæcal appendix
  - (*b*) Pelvic appendix
- (5) **Pelvic :** Pelvic appendix
- (6) **Intestinal :** Perforations
  - (*a*) Pre ileal appendix
  - (*b*) Appendicular band
- (7) **Gastro duodenal :**
  : Migrated gastro duodenal contents
- (8) Biliary . sub hepatic appendix
- (9) Hip joint psoas appendix

Differential diagnosis in a case of acute appendicitis

(1) *Conditions not requiring operation*

(A) **Referred causes :**
- (*a*) **Basal pleurisy**
- (*b*) Spinal caries
- (*c*) Tabetic crises

(B) **Colics :**
- (*a*) Reno ureteral
- (*b*) Intestinal

(c) Uteral
(d) Biliary

(C) **Medical causes:**
(a) ***Pyelitis***
(b) **Colitis**
(c) **Typhoid**
(d) Uræmia
(e) Intestinal influenza
(f) Muscular rheumatism

(2) *Conditions requiring operations*

(A) *Extra peritoneal.*
(a) Reno ureteral **stones**
(b) **Psoas affection: Abscess**
(c) Iliac lymphadenic abscess
(d) Iliac osteomyelitis
(e) Acute torsion of the testis

(B) *Intra peritoneal*
(a) **Local: Acute ileo-cæcal affections**
(1) **Volvulus**
(2) **Intussusception**
(3) **Typhoid perforation**
(4) **Meckel's diverticulitis**
(5) **Regional ileitis**
(6) **Cæcal obstruction:**
(a) Tuberculous. acute on chronic
(b) Carcinoma acute on chronic
(c) Volvulus acute
(d) Intussusception
(7) **Ileo-cæcal lymphadenitis**

(b) **Pelvic: Genito-urinary affections**
(1) **Acute salpingitis:** Pyosalpinx
(2) **Ectopic gestation**
(3) Early pregnancy
(4) Twisted ovarian cyst
(5) Ruptured lutein cyst

(c) **General peritoneal:**
(1) ***Duodenal perforation***
(2) Acute cholecystitis
(3) **Intestinal obstruction**
(4) Torsion omentum

Differential diagnosis: Sex factor

(1) Females. (a) T B cæcum
(b) **Pyelitis**
(c) ***Salpingitis***
(d) Cholecystitis

(2) Males: **Torsion of the right testis**

Differential diagnosis: Age factor

(1) Children:
- (*a*) **Pleurisy or pneumonia**
- (*b*) Tabes mesenterica
- (*c*) Iliac lymphadenitis
- (*d*) Pyelitis
- (*e*) Cholecystitis. (high appendix)
- (*f*) Intussusception
- (*g*) **Worms**

(2) Old:
- (*a*) Diverticulitis
- (*b*) Carcinomatous obstruction
- (*c*) Fæcal impaction

Complications: *Of acute appendicitis*
. (See post operative compl too)

(1) **Peritonitis:**

Sites: (*a*) Local
(*b*) **Spreading**
(*c*) **Residual:** pelvic, sub-diaphragmatic

Varieties: (α) Plastic → fibrosis → adhesions
(β) Suppurative → abscesses
(γ) Fulminating → peritoneal toxæmia

(2) **Intestinal obstruction:**

Varieties. (A) **Mechanical:**
(*a*) Primary. appendicular band
(*b*) Secondary: band due to appendicitis
(B) **Paralytic**

(3) **Fæcal fistula:** External or internal

(*a*) Pathological: (α) Inflammation
↓ (β) Abscess formation
↓ (γ) Bursting

(*b*) Post-operative: (α) Traumatic
(β) Pressure necrosis
(γ) Pathological necrosis

(4) **Pylephlebitis with portal pyæmia:**

Etio: Gangrenous appendicitis

Clinic: (*a*) Rigors
(*b*) Jaundice
(*c*) Hepatic tender enlargement
(*d*) Toxæmia

(5) **Thoracic complications:**
- (*a*) Pleurisy
- (*b*) Pneumonia
- (*c*) Empyema

(6) Femoral or iliac thrombophlebitis

(7) Septicæmia

Prognosis Factors

(1) **Age:** (a) **Very bad in children:**

(a) Anatomical causes
(β) Poor resistance
(γ) Incorrect diagnosis
(δ) Catharsis
(ε) Delay in operation

So (1) *Never forget appendicitis in childre*
(2) *Never give purgative in acut abdominal pain*
(3) *Operate immediately once th diagnosis is settled*
(4) *When in doubt, operate*

(b) **Bad in seniles:** Due to

(1) Peritonitis
(2) Paralytic ileus
(3) Broncho pneumonia
(4) Heart failure

(2) **Stage:**

Prognosis bad (a) Gangrene
(b) Perforation
(c) Spreading peritonitis
(d) Paralytic ileus

(3) **Course:**

Prognosis bad if operation is forced between 3rd da and 10th day

(4) **Type**·

Prognosis in the descending order
(a) Gangrenous Worst
(b) Obstructive Worse
(c) Inflammatory Bad

Treatment *Of acute appendicitis*

(I) *Operative treatment*

Time Ind (a) **Immediate:** First 48 hours
Every acute case seen within 48 hours
(b) **Expectant → secondary operation:**
: 48 hours to 10th day
(c) **Opening of an appendicular abscess:**
10th day to 3 weeks
(d) **Interference for a complication:**
Any time it appears
(e) **Interval operation:**
3 weeks to 3 months

(1) *Immediate appendicectomy.*

Ind. (A) *Every acute case seen within 48 hours*

(B) *Under the following circumstances.*

- (*a*) **Age:** (α) *Children under 10*
  - (β) Seniles after 50
- (*b*) **Sex:** *Pregnant females*
- (*c*) **Circumstances:**
  - (α) *Diagnosis not certain*
    Exploratory laparotomy
  - (β) Patient not under observation
  - (γ) Patient outside available surgical aid
  - (δ) Patient not expected in interval period
- (*d*) **Previous history:** First acute attack
- (*e*) **Present history:**
  - (α) Previous morphia
  - (β) *Previous catharsis*
- (*f*) **Local examination:**
  - (α) Pulse above 100
  - (β) Hyperæsthesia in Sherren's triangle
  - (γ) Signs of *perforation*
  - (δ) Spreading peritonitis

(C) *Failure of observative expectant treatment:*

- (*a*) **Pain:**
  - (α) Continuance after 6 hours rest
  - (β) *Sudden disappearance*
    - (1) Morphia
    - (2) Perforation
  - (γ) Change in character
    · Colicky → continuous peritoneal
- (*b*) **Vomiting:**
  - (α) *Persistence after 6 hours*
  - (β) Appearance de novo
  - (γ) Change in character
    - (1) Peritonism
    - ↓ (2) Peritonitis
    - ↓ (3) Obstructive: ileus
- (*c*) **Pulse and temperature:**
  - (α) Persistence above 100 after 6 hours
  - (β) *Rising pulse rate*
  - (γ) Pulse varying conversely with temp.
  - (δ) Sudden fall in temperature
- (*d*) **Local examination:**
  - (1) Hyperæsthesia:
    : Sudden disappearance

(2) Rigidity
(α) Spreading
(β) Sudden disappearance
(3) Tenderness
(α) Spreading
(β) Sudden disappearance
(4) Mass
(α) Spreading
(β) Softening → fluctuating
(5) Skin inflammatory œdema

(e) **General examination:**
(α) General toxæmia
(β) Hectic temperature
(γ) Rigors

(f) **Special examination:**
Leucocytosis
(α) Rising
(β) *More than 20000*

(D) *Immediate school of thought*
Operate immediately at any stage
Except (a) Subsiding inflammatory mass
(b) Advanced peritonitis with toxæmia

(2) *Appendicular abscess drainage* 10th day to 3 weeks
(A) *Without appendicectomy*
(B) *With appendicectomy*
Ind (a) History of more than 10 days
(b) **Localised fluctuating mass**
(c) Inflammatory œdema of the skin
(d) General septic toxæmia temp above 100
(e) **Leucocytosis > 20000**

(3) *Complication operations*
At the time of their presence
(a) Spreading peritonitis
Appendicectomy and drainage
(b) Paralytic ileus
Cæcostomy with or without appendicectomy
(c) Pylephlebitis
Ileo-colic vein ligature + appendicectomy
(d) Residual abscesses
Drainage

(4) *Interval appendicectomy 3 weeks to 3 months*
(a) 3 weeks after a mild attack
(b) 6 weeks after a subacute attack
(c) 12 weeks after an acute attack

(II) *Observe conservative treatment :*

Ind : (A) **Operation contra indicated :**
- (a) Patient *unwilling* for operation
- (b) Patient *too bad*
- (c) Patient *recovering* under expectant treat

(B) **Cases seen 48 hours after onset :**
- (a) *With no special indications for immediate interference* (See above)
- (b) No signs of failure of expectant treatment (See above)

(C) **Appendicular or residual abscesses :**
- (a) Until localised
- (b) Failure of localisation

(D) **Spreading peritonitis :**
- (a) *Early* cases with shock and toxæmia
- (b) *Late cases*

(E) **Chronic appendicular mass**

(F) **Circumstances :**
- (a) Good experienced surgeon
- (b) *Patient under constant observation*

Results. (I) **Resolution :** Gradual amelioration of signs

(II) **Failure :**

(A) **Perforation :**
- (a) Peritonism shock + vomit
- (b) Sudden relief of (1) Pain
  (2) Tenderness
  (3) Hyperæsth

(B) **Gangrene :**
- (a) Loss of pain & tenderness
- (b) Fulminating course
- (c) Toxæmia

(C) **Transmigration of sepsis**
(D) **Failure of localisation**
(E) **Intestinal obstruction :** Paralytic ileus
(F) **Portal embolism**
(G) **General toxæmia**

Giving rise to.
- (1) Peritonitis (a) Spreading
  (b) Residual abscesses
- (2) Paralytic ileus
- (3) Portal pyæmia
- (4) General toxæmia

(III) **Intercurrent complications :**
- (1) Parotitis
- (2) Chest affections

Advantages (1) No subphrenic abscess
(2) No pylephlebitis
(3) Intestinal obstruction rarer

Disadvant (a) Failure at any moment
(b) Abuse of the method
(c) Patient not turning up in quiescent period

(I) CONSERVO-OBSERVATIVE TREATMENT

Syn **Ochsner-Sherren**

Tech (1) **Fowler's position**

(2) **Diet:** (a) Nothing by mouth first 48 hours
(b) *Glucose water sips 3rd to 5th day*
(c) Milk diet 5th to 7th day
(d) Light fluid diet : 7th to 10th day

(3) **Oral hygiene:** Gargles and lemon

(4) **Hydrotherapy:**
(a) Intravenous } Glucose saline
(b) Rectal }

(5) **Chemotherapy:** Prontosil, soluseptasine

(6) **Bowels:**
(a) No purgatives or laxatives
Till pulse and temp are normal for a week
(b) Small glycerine enema
On the 4th day

(7) **No morphia**

(8) **Hot water bag** } to the local part
or Radiant heat }

(9) **Observe:**

(a) **Pain.** (α) Continuance
(β) *Sudden disappearance*
(γ) Change in character

(b) **Vomiting:** (α) *Continuance*
(β) Appearance
(γ) Change in character

(c) **Temp:** (α) Continuance
(β) *Sudden fall*
(γ) Changes
(δ) Relation to pulse

(d) **Pulse:** (α) Persistence
(β) *Rise* or fall of rate
(γ) Relation to temp.

(e) **Constipation or diarrhoea**

(f) **Local examination:**
(1) **Hyperæsthesia:**
(α) Presence or absence
(β) Sudden disappearance

(2) **Tenderness :**
(α) *Extent*
(β) Sudden disappearance
(3) **Rigidity :**
(α) *Extent :*
: Localising, decreasing, increasing
(β) Sudden disappearance
(4) **Distension :** Local, spreading, general
(5) **Mass :**
(α) Extent . spreading
: localising
: decreasing
(β) Consistency : softening
: hardening
(6) **Implication of skin :** Œdema
: Redness

(g) **Regional examination :**
(1) **Pelvis :** (α) Bowel habit
(β) *P R. or P.V.*
(2) **Liver :** Tenderness enlargemen
(3) *Chest*
(4) **Oral cavity**
(5) **Parotid glands**

(h) **General examination :**
(1) Temperature
(2) Toxæmia

(i) **Special examination :**
: **Leucocytosis :** Increasing
. > 20000

(10) **Keep the theatre ready for operation :**
. Immediately the signs of failure set in

(II) APPENDICECTOMY :

(A) *Anæsthesia :*
(a) **Spinal**
(b) Local
(c) General

(B) *Incisions :*
(1) *Rutherford Morison : muscle cutting*
Ind : (a) **Routine for all acute cases**
(b) Drainage of an abscess
(c) Extra peritoneal retrocæcal appendix
(2) *McBurney : grid-iron*
Ind : (a) Diagnosis certain
(b) **Right iliac appendix**
(c) Isolated appendicitis :
: With general peritoneum shut off

(d) Appendicular abscess
(e) General exploration not required
(f) Late stages of peritonitis

(2a) Grid iron enlargement
(a) Grid iron incision
+ (b) Detachment of int. oblique from rectus
Ind McBurrey incision
+ Append x out of reach on medial side

(3) *Battle*
Ind (a) Isolated appendicitis requiring good exposure
(b) Pelvic or pre ileal appendix
(c) Access to female generative organs

(4) *Paramedian*
Ind (a) Acute attack within 48 hours
(b) **Diagnosis uncertain**
(c) **General exploration**
(d) Pelvic appendix
(e) Pre ileal appendix
(f) Interval period

(5) Median
* Ind Females with concomitant pelvic signs

(6) Right inguinal hernia
Incidental

(C) *Steps*
(a) Opening of the peritoneal cavity
(b) General inspection of right iliac fossa
For signs of inflammation
(c) *Isolation from the general peritoneal cavity*
By abdominal sponges
(d) Protection of wound margins by sponges
(e) Mobilisation and delivery of the cæcum
(f) Exploration and examination of appendix
Follow the tænia coli
(g) Fixation of the appendix
Catch by meso appendix
(h) Ligature and division of meso appendix
(i) Purse string
(j) Appendicectomy
(α) Cuff method
(β) Crush method
(γ) Three clamps method
(k) Treatment of the stump
(α) Ligature → cut → carbolise
↓ (β) Burial
or (γ) Non burial
(1) As a practice
(2) Friable appendix

(3) Friable cæcum
(4) Appendicular gangrene
(5) Appendicular abscess

(l) Exploration
(α) Quiescent cases
(1) Pelvic organs
(2) Ureter & kidney pelvis
(3) Meckel s diverticulum
(4) Gastro-duodenum
(5) Gall bladder
(6) Intestines
(β) Acute cases
(a) If appendicitis +
(1) Pelvis (a) Inspection
(b) Diagnostic swab
(2) Ureter
(3) Meckel
(b) If appendicitis is absent or secondary
Examine as in quiescent cases
Especially (1) Last part of ileum
(2) Pelvic organs
(3) Ureter
(4) Duodenum

(m) Taking out and counting the abdominal mops

(n) Drainage
Ind (1) Purulent fluid (a) Local
(b) Pelvic
(c) General
(2) Perforated appendix
(3) Gangrenous appendix
(4) Fæcolith in peritoreal cavity
(5) Partial apperdicectomy
Contraind (a) Unperforated appendix
(b) Manipulative perforation
(c) Recent perforation
With serous exudate
Sites (a) Original incision ×
(b) Right lumbar stab
2" behind ant. sup spine
Well above the crest
(c) Suprapubic stab
If diagnostic pelvic swab is +
Material Rubber tissue or tube
Compl (1) Paralytic ileus
(2) Faecal fistula
(3) Secondary hæmorrhage
(4) Adhesions
(5) Persistent sinus
(6) Ventral hernia

Points Drainage tube should not be
- (a) Too thick or too thin
- (b) Too long or too short
- (c) Too big or too small
- (d) In relation to (α) Sutures
  - (β) Intestines
  - (γ) Vessels
- (e) Kept for too long or too short a time

(D) *Additional procedures in acute appendicectomy*

(1) Ligature of ileo-colic vein

Ind *Prophylactic for portal pyæmia*
Rigors in the course of appendicitis

(2) Caecostomy

Ind (a) Wide-spread peritonitis
- (b) Paralytic ileus
- (c) Internal fistula preventive

Tech Tie in de Pezzer catheter in cæcum or appendix stump

(3) Drainage of pelvic abscess
- (a) Suprapubic stab
- or (b) Rectal drainage

(E) *Difficulties in appendicectomy*

(1) **Pathological**·
- (a) Acute cases
  - (α) Adhesions
  - (β) Hæmorrhage
  - (γ) Friability
    Due to gangrene or œdema
  - (δ) Paralytic distension
- (b) Chronic cases
  Adhesions → immobility → inaccessibility

(2) **Anatomical**·
- (a) Non mobile cæcum
- (b) Inaccessible appendix
- (c) Fat, friable mesentery
- (d) Thin, friable peritoneum

(3) **Anæsthesia:**
- (a) Rigid abdominal wall
- (b) Retching with evisceration

(4) **Technical:**
- (a) Wrong incision (α) Inappropriate site
  - (β) Too small
- (b) Futile and rough search for appendix·
  ↓ (1) Tearing of cæcum or appendix
  - (2) Tearing of adhesions or intestines
  - (3) Hæmorrhage
  - (4) Burst abscess

(F) *Other methods of appendicectomy in difficult cases*

(1) Retrograde appendicectomy

Ind (a) Tip not found or handy
(b) Base more accessible than tip
(c) Surety of whole appendix being removed

Contraind Whole of the appendix not visible

(2) Submucus resection of appendix

Ind Buried, friable appendix

Tech Shelling out the muc. mem

(3) Partial appendicectomy

Ind (a) Gangrenous friable appendix
(b) Incorporation in abscess wall

(III) APPENDICITIS WITH PERITONEAL ABSCESS

(A) **Observo conservative Ochsner Sherren**

Ind (1) Localising
(2) Absorption

Contraind (a) Children
(b) Failure of expectant treatment

Tech (a) (See above)
\+ (b) Local examination every day
\+ (c) Rectal examination every third day

(B) **Operative**·

Ind (a) Children
(b) Localisation
(c) Failure of Ochsner Sherren
(α) Lump (1) Not smaller after 5th day
(2) Getting larger
(3) Visible to the eye
(β) Burst abscess → peritonitis
(γ) Temp above 100
(d) History of two to three weeks
(e) Signs of pointing
(f) Leucocytosis > 20 000

Tech (1) **Drainage**
(2) **Drainage + Appendicectomy**

Steps (1) Anæsthesia evipan, spinal
(2) Incision (a) Over the centre of the swelling
\+ (b) Upto the abscess wall
\+ (c) Divide all layers in one axis
(3) Protection of margins by sponges
(4) Isolation of the area by sponges around
(5) Opening of the abscess
By (a) Blunt artery forceps
(b) Finger tip
(6) Evacuation of pus

(7) Removal of the appendix
 (a) Only if free and in the centre of the cavity
 (b) Never disturb the abscess wall
(8) Drainage corrugated rubber sheet

(A) *Retro cæcal extra peritoneal abscess*
 (1) Incision (a) Centre of the swelling
 or (b) Rutherford Morison
 (2) Tech do not open the peritoneal cavity
 (3) Drainage (a) Stab in the right loin
 or (b) Outer angle of the wound

(B) *Right iliac intra peritoneal abscess*
 (1) Incisions
 (a) Local
 (α) Centre of the swelling
 (β) As much lateral as possible
 (γ) Rt angles to grid iron
 or (b) Grid iron
 or (c) Morison
 (2) Divide all layers in the same axis
 (3) Open by finger
 (4) Always explore the pelvis
 (a) Inspection
 (b) Dry sponge test
 (5) Drainage (a) Incisional
 or (b) Right lumbar

Diff (1) Failure of location
 (2) Unresolved hard mass
 Leave alone close the abdomen
 (3) Injury to cæcum or intestines fæcal fistula
 (4) Burst open in general cavity peritonitis

(C) *Pelvic abscess*
 (1) *If with appendicectomy or iliac abscess*
Incisions (a) For appendix or iliac abscess
 (α) Centre of the swelling
 or (β) Paramedian
 or (γ) Morison
 (b) For pelvic abscess
 (α) Suprapubic stab
 or (β) Rectal
 (2) *If detected or suspected independently*
Diagnosis (a) History
 (b) Free discharge of mucus per anum
 (c) P R soft cystic swelling
 (d) Absence of abdominal rigidity

Drainage: (A) **Blind rectal:**
Ind: Pointing into the rectum
Pre oper: Empty the bladder
: Wash the rectum
Anæsth: Low spinal
: Evipan
Posture: Exaggerated lithotomy
Tech: (*a*) Speculum: (mucus drop)
↓ (*b*) Hilton's method
↓ (*c*) Drainage tube
↓ (*d*) Fixation to anus: for 4 days
(B) **Exploratory laparotomy:**
↓ Identification and **closure**
↓ **Rectal drain**
Ind: Associated appendix trouble
(C) Posterior colpotomy.
Ind (*a*) Pointing to rectum
+ (*b*) Married women
(D) Suprapubic
Contraind · Soiling of general peritoneum

(IV) APPENDICITIS WITH SPREADING PERITONITIS:

(A) **Observo-conservative: Ochsner-Sherren**
Ind: (*a*) **Early cases:** With shock and toxæmia
(*b*) **Advanced cases:** After 60 hours
Contraind: (1) Childhood
(2) Recent perforation of appendix ab cess
Tech: (*a*) Ochsner-Sherren
(*b*) Intravenous (α) Glucose saline
(β) Anti gas gangrene
(γ) Sulphonamide group

(B) **Operative:**
Ind: (*a*) Early cases
(*b*) Recent perforation
(*c*) Local advanced signs: right iliac peritonitis
: With mild general peritonitis
(*d*) Good general condition
(*e*) Oncoming or early paralytic ileus
(*f*) Children
Tech: (1) Appendicectomy
+ (2) Drainage: (*a*) Suprapubic
(*b*) Lumbar
+ (3) Cæcostomy

Pre. & post oper:
(*a*) Intravenous (α) Hydro therapy
(β) Chemo therapy
(γ) Blood transfusion

(*b*) Duodenal suction tube
(*c*) Morphia + pitressin

Post operative treatment of appendicectomy

(1) **Position:** (*a*) High Fowler
(*b*) Flexed hips
(*c*) Pillow under left loin if abscess

(2) **Diet:** (*a*) Glucose water sips 2 days
↓ (*b*) Citrated milk + barley 2 days
↓ (*c*) Citrated whole milk 2 days
↓ (*d*) Milk + Benger + biscuits 2 days
↓ (*e*) Light diet

(3) **Bowels:** (1) Glycerine syringe 4th day
(2) Liquid paraffin from 5th night
(3) No purge for three weeks

(4) **Lungs** (*a*) Deep breathing
(*b*) Anti pneumonic prophylaxis
(*c*) A S A injections

(5) **Wound:**
(A) If clean (*a*) Redress 4th morning
↓ (*b*) Sutures out on 11th day
but (*c*) Open if pyrexia
(B) If septic (1) Dress daily
(2) Cut sutures under tension
(C) If drainage
(*a*) Keep for three days daily rotate
↓ (*b*) Remove → clean → insert
As long as discharge +
↓ (*c*) Daily shorten → take out
When discharge diminishes

(6) **Mouth hygiene** Gargle sialogogues

(7) **Intravenous therapy.**
(*a*) Glucose in all acute cases
(*b*) Saline in shock, vomiting, peritonitis
(*c*) Anti gas gangrene in peritonitis
(*d*) Mercurochrome 10 c.cs
In peritonitis pylephlebitis
(*e*) Sulphonamide group

Post-compl (1) **Shock**
Time Within 24 hours
Causes (*a*) Septic toxaemia
(*b*) Rough handling
(*c*) Prolonged anaesthesia
Treat Anti shock

(2) **Acute gastric dilatation**
Time 24–72 hours

Treat (*a*) Postural + **gastro duodenal drainage**
(*b*) Hydro therapy

(3) **Peritonitis:**

Time Pre operative → post operative 6 days

Causes (*a*) Pre operative
(α) Gangrene
(β) Perforation
(γ) Transmigration
(δ) Burst abscess
(*b*) Operative
(1) Soiling of general peritoneum
(2) Damage to barriers
(*c*) Post operative bursting appendix stump

Treat (A) Pre operative
(*a*) Intravenous
(1) Hydro therapy
(2) Gluco therapy
(3) Sero therapy
(4) Chemo therapy
(*b*) **Ochsner Sherren**
↓ (B) Operative
(*a*) Gentle handling
(*b*) Non soiling
(c) **Appendicectomy**
(*d*) Drainage
(*e*) Prophylactic cæcostomy
↓ (C) Post operative
(α) As under (A)
(β) Attention to drainage

(4) **Paralytic ileus.**

Time Pre operative → post operative 6 days

Causes (*a*) Peritonitis
(*b*) Mal handling
(*c*) Drainage tube
(*d*) Residual abscess

Treat (A) Conservative (See under Paralytic Ileus)
(B) Operative
(1) **Cæcostomy**
(2) Jejuno transversostomy
(C) Treatment of etiology

(5) **General peritoneal toxæmia or septicæmia:**

Time Pre operative → post operative

Treat (*a*) Gastro duodenal suction drain
(*b*) **Intravenous:**
(1) Hydro therapy
(2) Gluco therapy

(3) Sero therapy
(4) Chemo therapy
(5) Hæmo-therapy

(6) Wound infection:

Time Post operative 5th–15th day

Varieties
(1) Stitch abscess
(2) Mural abscess
(3) Cellulitis
(4) Gangrene (*a*) septic, (*b*) anærobic
(5) Burst abdomen
(6) Secondary hæmorrhage

Causes
(*a*) Gangrenous or perforated appendix
(*b*) Appendix abscess
(*c*) Peritonitis
(*d*) Drainage tube

Treat
(1) Removal of an infected suture
(2) Removal of many stitches
\+ Mag sulph glycerine pack
(3) Sero therapy
(4) Chemo therapy

(7) Fæcal fistula:

(A) External:

Time **6th to 10th day**

Causes
(*a*) [illegible]
(*b*) [illegible]
(*c*) [illegible]
(*d*) Mal handling
(*e*) Prolonged drainage tube

Treat
(1) **Conservative: For three months**
(*a*) Restrict fluids and food
(*b*) Astringents bismuth & opium
(*c*) Protective dressings
(*d*) Bowel lavage
↓ (2) Operative
(*a*) Closure
(*b*) Short circuit
(*c*) Excision

(B) Internal:

Time 4th or 5th day
Cause Early large enema
Path Bursting appendix stump
Clinic General peritonitis
Treat (*a*) Prophylactic cæcostomy
(*b*) Therapeutic open and drain

(8) Pylephlebitis → Portal pyæmia:

Time: Pre-operative → post operative 10 days

Causes: (a) Fulminating (gangrenous) appendicitis
(b) Inopporture appendicectomy
(c) Mal handling of tissues or abscess wall

Clinic: (1) Rigors with hectic temperature
(2) Icterus
(3) Enlarged and tender liver

Treat: (A) Prophylactic:
(a) **Ligature of ileo-colic vein**
(b) Choose the best time for operation
(c) Do least possible
(d) Delicate handling

(B) Therapeutic:
: Intravenous (a) Chemo-therapy
(b) Hæmo therapy

(9) **Residual abscesses:**

Time: Pre operative → post operative 1 month

Sites: (A) **Right iliac abscess:**

Treat: Drainage

(B) **Pelvic abscess:**

Causes (a) Pelvic or promontoric appendix
(b) Peritonitis with Fowler position
(c) Leaking right iliac abscess

Clinic. (a) Diarrhœa with mucus
(b) General septic toxæmia
(c) P R. soft cystic swelling
(d) Leucocytosis > 20,000

Treat Rectal drainage

(C) **Sub-phrenic abscess:**

Clinic (a) Local peritonitis
(b) Basal chest signs
(c) General toxæmia

Treat Drainage

(D) **Perinephric abscess:**

Cause. Retrocæcal appendix

Clinic (a) Local signs
(b) Urinary signs
(c) General signs

Treat: Drainage

(E) **Left iliac abscess:**

Cause: Overflowing pelvic abscess

Treat: (1) Rectal drain
(2) Suprapubic drain

(F) **Central abscess:**

Cause: (a) Pre ileal appendix
(b) Medial bursting of appendix abscess

Clinic (1) Paralytic ileus. local → general
↓ (2) Peritonitis

Treat Exploration and drainage

(10) Intestinal obstruction:

(A) **Primary:**

Time Pre operative

Cause Appendix acting as a band

(B) **Adhesive:**

Time (*a*) Pre operative: adhesions
(*b*) Post operative adhesions and bands
(α) Early 6–10 days
(β) Mid 3rd week (Pelvic peritonitis)
(γ) Late after 3 months to years

(C) **Paralytic** (See paralytic ileus above)

Time 48 hours after the cause

Cause (*a*) Local appendicular sepsis
(*b*) Residual abscess
(*c*) General peritonitis
(*d*) Exposure and operative trauma
(*e*) Too prolonged or faulty drainage tube
(*f*) Toxæmia

(D) **Functional:** Constipation

Treat Treat the cause

(11) Chest complications:

Time Post operative (*a*) 24 hours to 5th day
(*b*) Any time if embolism

Varieties (*a*) Lungs Pneumonia
Œdema
Collapse
Embolism
(*b*) Pleura Pleurisy → empyema

Causes (1) Toxæmia
(2) **Anæsthesia:** Aspiration, irritative
(3) **Hypostatic**
(4) Subphrenic abscess

Treat Prophylactic and therapeutic anti pneumonic
+ (1) Deep breathing
+ (2) A S A injections

(12) Urinary complications:

Time Pre operative → post operative catheter period

Varieties (*a*) Urethritis
↓ (*b*) Cystitis or epididymo-orchitis
↓ (*c*) Ureteritis
↓ (*d*) Pyelitis

Causes (1) **Spread from appendix.**
(*a*) Pelvic
(*b*) Promontoric
(*c*) Retrocæcal
(2) **Residual abscess contact:**
(*a*) Pelvic
(*b*) Perinephric
(3) Associated independent condition
(4) **Catheterisation** Post operative

Treat (*a*) Remove the cause
(*b*) Urinary antiseptics

(13) **Parotitis**

Time Post operative 4th → 7th day

Causes Sepsis ascending from oral cavity
(*a*) Intestinal toxæmia
(*b*) Starvation
(*c*) Dehydration → desalivation

Clinic (1) Painful trismus
↓ (2) Fullness in parotid area
↓ (3) Parotid inflammation
↓ (4) Parotid abscess

Treat (A) Prophylactic
(1) **Mouth hygiene gargles**
(2) **Sialogogues: lemon**
(3) Hydro therapy
(4) Treat constipation
(B) Curative
(1) Prophylactic
+ (2) Fomentations
+ (3) Counter irritants
↓ (4) Incision and drainage

(14) **Thrombo phlebitis·**

Time Upto convalescence

Sites (*a*) Iliac vein
(*b*) Femoral vein
(*c*) Saphenous vein

Causes (1) Pressure of drainage tube
(2) Debility + circulatory stasis

Clinic (*a*) Local examination cord like feel
(*b*) Distal examination œdema foot & leg
(*c*) Rise in temperature and pulse

Compl (*a*) Distal œdema
(*b*) Embolism

Treat (A) Prophylactic
(*a*) Mobility of extremities
(*b*) Circulatory stimulants

(B) Therapeutic
  (a) Absolute fixation in elevation
   : For 3 weeks
  ↓ (b) Massage and elastoplast :
   . After 3 weeks

(15) Abnormal scar:

Time Post operative upto 6 months

Varieties (A) **Persistent sinus:**

Causes (a) Prolonged drain
 (b) Unabsorbable septic suture
 (c) Tuberculosis or actinomycosis or regional enteritis

Treat (1) Treat the cause
 (2) Curettage

(B) **Painful scar:**

Treat Under cutting

(C) **Septic scar:**

Cause Underlying sepsis
Clinic Tender œdematous scar
Treat Explore and drain

(D) **Keloid:**

Cause. (a) Friction
 (b) Sepsis
Treat (a) Apply collodion
 (b) Avoid friction

(F) **Distal anæsthesia or neuralgia:**

Cause Trauma to the sensory nerve

(F) **Ventral incisional hernia:**

Time Post operative 3 to 6 months
Causes (a) Septic wound
 (b) Lack of rest straining
 (c) Prolonged drainage
 (d) Nerve trauma
 (e) Burst abdomen partial
 (f) Subsequent pregnancy
Treat (A) Prophylactic
  (a) Avoidance of etiology
  (b) Avoidance of strains
  (c) Abdominal binder for 3 months
 (B) Therapeutic Gallie's fascioplasty

(16) Inguinal hernia:

Time Post operative after 3 months
Cause Trauma to the inguinal nerve
 (a) Operative trauma
 (b) Drainage through McBurney

Clinic (a) McBurney scar
(b) History of drainage
(c) Inguinal hernia
Treat Gallie's hernioplasty

IMPORTANT POINTS

(1) *Rigidity and pain in right iliac fossa with high temp*
  (a) *Acute appendicitis*
  (b) *Acute pyelitis*
  (c) *Duodenal perforation*
  (d) *Right sided basal pneumonia*

(2) *Classical indications for Ochsner Sherren*
  (a) *More than 3 days history*
  + (b) *Pulse not above 90*
  + (c) *Localised mass*

(3) *Main contra indications for Ochsner Sherren*
  (1) *History of less than 48 hours*
  (2) *Children and seniles*
  (3) *Uncertain diagnosis*
  (4) *Patient outside constant observation*
  (5) *History of catharsis*
  (6) *Recent perforation or gangrene appendix*
  (7) *Rising pulse rate*

(4) Appendicitis in pregnancy
Diff diag (a) Pregnancy pyelitis
(b) Pregnancy vomiting
(c) Ruptured tubal gestation
(d) Twisted ovarian cyst
Compl Abortion
Treat Ignore the pregnancy
Treat the appendix

(5) Grid iron McBurney incision is the best one for removal of an acutely inflamed appendix

(6) Swinging temperature with fast pulse after appendicitis or appendicectomy
  (a) Abdominal wall abscess
  (b) Residual abscess
  (c) Pylephlebitis
  (d) Parotitis
  (e) Lung complications
  (f) Urinary sepsis pyelitis
  (g) Thrombo phlebitis

(7) *Every case of acute appendicitis, examine*
  (a) *The right lung*
  (b) *The right kidney*

- (c) *The right testis*
- (d) *The right tube*
- (e) *The duodenal area*

(8) Special signs in acute appendicitis

- (a) Rovsing acute appendicitis
  Pain in right iliac fossa on pressure over left iliac fossa
- (b) La Roque gangrenous appendicitis
  Retraction of right testis on pressure over McBurney
- (c) Psoas test iliac appendix
  Pain on extension + abduction of thigh
- (d) Obturator test pelvic appendix
  Pain in hypogastrium on flexion + inversion of thigh
- (e) B
  the straight right leg
  maintained on the most
  tender spot in the flank
- (f) Altschuler retrocaecal appendix
  Tenderness and localised muscle spasm situated over the right pelvic margin from ant sup iliac spine downwards

(9) In appendicectomy

- (a) Never cut through inflamed and oedematous omental adhesions
- (b) Never hook out acutely inflamed adherent appendix

(10) On no account tear through the hard indurated appendix mass with the finger in an endeavour to find central pus, faecal fistula is the invariable result of the procedure

(11) *In operation for acute appendicitis if the diagnosis is confirmed during operation do not explore the upper or left part of the abdomen* as sepsis may be carried manually in non septic parts.

(12) *Do not fail to explore pelvis in all cases of acute appendicitis* except in retro caecal cases. *Do the diagnostic swab test*

(13) *Beware of putting a patient into Trendelenburg position in lower acute abdomen* as the pus may gravitate and infect the upper abdomen also

(14) *In every acute abdomen with a diagnosable local focus, the posture should be such that the local focus is always in the most dependant position,* so that the septic discharges do not gravitate into the virgin parts of the peritoneal cavity *Same is true of post-operative drainage*

(15) Do not handle acute appendix roughly, as the localisation may break at any time

(16) There are many surgeons who believe that to delay operation in any stage of acute appendicitis is to gamble with death

(17) In general peritonitis, determine whether the appendicitis is primary or secondary, by inspection of the region and slitting open the organ

(18) *Never forget to palpate the right ureter before appendicectomy,* as an impaction of a stone in abdominal ureter gives all the signs of acute appendicitis

(19) Remember that some cases of duodenal perforation simulate acute appendicitis

(20) *It is criminal to give Ochsner Sherren treatment outside a surgical hospital or nursing home or unless the patient is under the direct observation of the surgeon all the time In fact 'Ochsner Sherren treatment must be carried out on the threshold of an operation theatre'*

(21) It is criminal to fail to explain to the patient the dangers of not turning up for interval operation after the successful Ochsner Sherren treatment

(22) *In every case of acute abdominal pain with vomit*
Never give (*a*) *Morphia*
(*b*) *Purgative*
(*c*) *Big enema*

(23) Post operative complications of appendicectomy
(I) Abdominal
(A) Superficial
(*a*) Early (1) Stitch abscess
(2) Cellulitis
(3) Gangrene
(4) Burst abdomen
(*b*) Late (1) Abnormal scar
Painful
Infected
Anæsthetic or neuralgic
Keloid
Sinus
(2) Ventral hernia (Incisional)
(3) Inguinal hernia
(B) Intra abdominal
(*a*) Early (1) Peritonitis
(2) Acute dilatation stomach
(3) Paralytic ileus
(4) Residual abscesses
(5) Fæcal fistula
(6) Portal pyæmia
(*b*) Late Intestinal obstruction
(1) Adhesive
(2) Functional

(II) Other systems
- (A) Oral Parotitis
- (B) Chest (a) Lungs Pneumonia
  - Œdema
  - Collapse
  - Embolism
  - (b) Pleura Pleurisy
    - Empyema
- (C) Urine (a) Urethritis → epididymo orchitis
  - ↓ (b) Cystitis → ureteritis → pyelitis
- (D) Thrombo phlebitis

(III) General
- (A) Septicæmia
- (B) Toxæmia
- (C) Portal pyæmia
- (D) Shock

(24) Blind rectal drainage should be reserved for those cases where the diagnosis of pelvic abscess is a certainty
- (a) History
- (b) Mucus per anum
- (c) P R. soft cystic swelling
- (d) Absence of abdominal rigidity

(25) *Œdema of a scar denotes deep lying residual abscess*

(26) *Never give a large enema on the 4th day after appendicectomy* as it causes bursting of appendicular stump leading to internal fæcal fistula.

(27) *Aperients in acute appendicitis mean peritonitis*

(28) Drain in appendicectomy when appendix is
- (a) Gangrenous
- (b) Perforated
- (c) Friable and œdematous
- (d) Pus filled
- (e) Associated with spreading peritonitis.

(29) Spinal anæsthesia is the best in appendicectomy

(30) *Acute appendicitis is the most common cause of inflammatory acute abdomen*

(31) *Most important single sign of appendicitis is tender McBurney's point,* which is a point on the right spino umbilical line about 1 5"–2" from the ant. sup spine

(32) Important factors in the clinical features of appendicitis
- (a) Virulence and character of the attack
  - (1) Fulminating
  - (2) Acute
  - (3) Subacute
  - (4) Chronic
  - (5) Relapsing
  - (6) Recurrent.

(b) Stages
- (1) Pure appendicitis
- (2) Appendicitis + regional peritonitis
- (3) Appendicitis + spreading general peritonitis

(c) Pathological types
- (1) Inflammatory
  - (α) Catarrhal
  - (β) Suppurative
- (2) Obstructive appendicular obstruction
- (3) Thrombotic gangrenous appendicitis
- (4) Fibrotic chronic appendicitis

(d) Anatomical positions
- (1) Retrocæcal
- (2) Iliac mid inguinal
- (3) Promontoric
- (4) Pelvic
- (5) Pre ileal
- (6) Sub hepatic

(e) Associated complications
- (1) Residual abscesses
- (2) Spreading peritonitis
- (3) Intestinal obstruction
- (4) Pylephlebitis → portal pyæmia.

(33) Differential diagnosis of appendicitis
- (a) Thoracic causes basal inflammations
- (b) Spinal causes Pott s disease
- (c) Urinary causes pyelitis, ureteral stone
- (d) Pelvic causes salpingitis
- (e) Testicular causes acute torsion
- (f) Gastro duodenal causes peptic ulcers
- (g) Intestinal causes acute obstruction
- (h) Biliary causes cholecystitis
- (i) Regional causes iliac lymphadenitis

(34) *It is dangerous to hook out an appendix blindly, it may* lead to
- (a) Perforation
- (b) Hæmorrhage
- (c) Injury to external iliac artery

(35) *The safest method of delivery of an appendix is gentle traction on the cæcum*

(36) *If appendix or cæcum refuses to come out, enlarge the incision*

(37) *Best way to get at the appendix is to follow the taeniæ coli to their origin*

(38) Appendix cannot be found
- (a) Wrong orientation

(b) Whole of the appendix buried:
  (α) In cæcal wall
  (β) Retrocæcal
  (γ) By adhesions
(c) Intussusception: appendicular
(d) Previously taken out: through hernial incision

(39) Common difficulties in appendicectomy:
  (1) Rigidity of abdominal wall
  (2) Straining
  (3) Fixed cæcum
  (4) Ill-placed incision
  (5) Adhesions
  (6) Friability of tissues.

(40) *In retrograde appendicectomy, the whole course of appendix must be visible before the operation is commenced,* so that there is no likelihood of the gangrenous tip left behind.

(41) *Acute right iliac inflammation:*
  (a) *Acute appendicitis*
  (b) *Tuberculous typhlitis*
  (c) *Typhoid perforation*
  (d) *Meckel's diverticulitis*
  (e) *Salpingitis*
  (f) *Pyelitis or ureteritis*
  (g) *Iliac lymphadenitis.*

(42) *Appendicitis without rigidity of anterior abdominal wall:*
  (a) *Pelvic appendicitis*
  (b) *Retro caecal appendicitis*
  (c) *Pure appendicitis without peritonitis*
  (d) *Recent perforation*
  (e) *Gangrenous appendicitis*
  (f) *Appendicular obstruction*
  (g) *Late general peritonitis. paralytic ileus*

(43) Significance of symptoms in appendicitis.
  (a) Hyperæsthesia in Sherren triangle.
    : Unperforated tense appendix
  (b) Disappearance of already present hyperæsthesia:
    (α) Gradual: amelioration
    (β) Sudden: perforation or gangrene
  (c) Temperature.
    (α) Normal upto 100 5
    (β) Sudden drop. perforation
    (γ) Sudden rise:
      (i) Residual abscesses:
        (1) Abdominal wall
        (2) Right iliac
        (3) Pelvic
        (4) Left iliac

(5) Central
(6) Subphrenic
(7) Perinephric
(ii) Portal pyæmia
(iii) Pneumonia
(iv) Urinary sepsis
(v) Parotitis
(vi) Phlebitis
(δ) Inverse relation to pulse
Deterioration in the condition

(d) Pain
(α) Colicky (1) Unperforated tense appendix
(2) Obstructive appendicitis
(3) Appendicular obstruction
(β) Continuous (1) Peritonitis
(2) Distension
(γ) Sudden disappearance (1) Perforation
(2) Gangrene

(e) Vomiting
(α) Single, non repeated peritonism
(β) Appearance de novo (a) Perforation
(b) Peritonitis
(γ) Small, repeated peritonitis
(δ) Regurgitant ileus, obstruction

(44) *Acute appendicitis is the most common cause of faecal fistula*

(45) Indications for immediate operation
(a) Children seniles, pregnancies
(b) Within 48 hours
(c) Perforation or gangrene
(d) Appendicular localised abscess
(e) Appendicular spreading peritonitis
(α) Not too early
(β) Not too late
(f) History of catharsis
(g) Patients not under continuous observation
(h) Failure of conservative treatment
(i) Patients going out of surgical help
(j) Patients who may not turn up for interval operation.

(46) *Most important guiding sign in observation period is pulse, pulse over 100 or steady rise in pulse rate is an enough indication for immediate operation*

(47) *Isolation from the general peritoneal cavity is one of the most important steps in operation for acute appendicitis*

(48) *Never drain through McBurney incision*, as it leads to trauma to the ilio inguinal nerve with resultant post operative inguinal hernia.

(49) Treatment of acute appendicitis:
: Two schools of treatment:
(a) Operative: Operate at any stage
Contraind. (α) Subsiding mass
(β) Late toxæmic stage
(b) Observo-conservative:
Contraind. (α) Cases within 48 hours
(β) Special indications for operation:
(1) History catharsis
(2) Age two extremes
(3) Perforation and gangrene
(4) Ripe abscess
(γ) Inconveniences and failure of the treatment

(50) *In differential diagnosis of acute abdomen.*
(1) *Diagnose between medical and surgical conditions*
(2) *Diagnose between referred and abdominal conditions*
(3) *Diagnose between extra peritoneal and intra peritoneal conditions*
(4) *Diagnose between*
(a) *Immediate operation conditions*
(b) *Conservative treatment conditions*

(51) [illegible]

(52) *Ac*[illegible] but on [illegible]
(a [illegible]
(b) *Remember typhoid perforation.*

(53) Acute appendicitis syndrome with medial tenderness.
? Meckel's diverticulitis.

(54) *When a patient is seen during the first 50 hours of an attack of acute appendicitis,* no question arises as to the best treatment, it is agreed universally that *the appendix should be removed immediately on diagnosis*

(55) Hæmo peritoneum from a slipped ligature on the meso appendix *is not rare, so always transfix it*

(56) Some points on technique
(a) The most dangerous appendix for an attempt to hook it out, is the one situated on the promontory or in the pelvis
(b) The safest way of delivering the appendix is by gentle traction on the cæcum
(c) *If the appendix does not come out kindly, it means that more room is required*
(d) External iliac artery may feel very like the continuation of a pelvic appendix.

(57) In pelvic peritonitis, a suprapubic incision through a special stab above the pubes is a life saving measure

(58) Peritonitis with secondary appendicitis
Primary focus (a) Perforated duodenal ulcer
(b) Perforated typhoid ulcer
(c) Perforated diverticulitis

(59) *Conservative treatment of appendicitis must be carried out on the threshold of an operation theatre by the surgeon himself, keeping the theatre ready all the time it is criminal to attempt this treatment in a slip shod way or as a half hearted measure*

(60) *A rising pulse rate in the early stages is the most reliable single sign that it is dangerous to proceed with delayed treatment*, if the pulse rate has increased even ten points in the first four hours operation is indicated

(61) A moderate rise of temperature with a pulse rate in eighties or nineties, does not foretell failure of Ochsner Sherren treatment

(62) If delayed treatment fails and he patient has been starved for some days, the urine should be examined for acetone before anæsthesia in any case give glucose saline.

(63) The chief danger of Ochsner Sherren lies in its abuse as is true of most good things.

(64) *The rule 'where there is pus you must let it out may be broken in the case of small or moderate sized appendix abscess*

(65) Question of removing the appendix at the time of evacuation of appendix abscess never arises Evacuate only frank abscess.

(66) After drainage of the appendicular abscess, the interval period must be lengthened to at least 4 to 6 months before appendicectomy is done

(67) Diff diag of appendicular abscess
(1) Ballooned cæcum
(b) Twisted ovarian cyst
(c) Perforated diverticulitis
(α) Meckel
(β) Colon

(68) Most characteristic symptoms of appendicular pelvic abscess are (a) Diarrhœa
(b) Mucus per anum.

(69) Passage of mucus per anum occurring for the first time in a patient who has or has recently had an attack of acute appendicitis is pathognomonic of pelvic abscess

(70) Blind rectal drainage should be reserved for those cases where

(a) History
(b) Free discharge of mucous per anum
(c) [illegible]
(d) [illegible]

Make the diagnosis of pelvic abscess pointing into the rectum absolutely undeniable, if there is slightest doubt, perform exploratory laparotomy, if the diagnosis of pelvic abscess walled off from general peritoneal cavity is confirmed, close the abdomen and drain via rectum.

(71) Best line of treatment in perforated appendicitis with general peritonitis
- (a) Expeditious removal of appendix
- (b) Suprapubic drain
- (c) Cæcostomy or enterostomy

(72) *In appendicitis with general peritonitis for more than 60 hours duration,* the appendix is sure to be matted with neighbouring structures and therefore dangerous to be removed, under such circumstances, *delayed treatment is the only chance except*:
- *(a) In childhood and early adolescence*
- & *(b) Recent perforation of an appendix abscess*

(73) Acute appendicitis is not infrequent and a supremely important complication of pregnancy and if only the diagnosis can be established within 48 hours from the onset, appendicectomy must be done.

(74) *Some conditions simulating acute appendicitis*
- (a) Perforated diverticulitis of the colon
- *(b) Regional ileitis*
- *(c) Meckel's diverticulitis*
- (d) Torsion of
  - (1) *Great omentum*
  - (2) Appendix epiploicae
  - (3) Ovarian cyst
  - (4) Testis
- *(e) Suppurating deep iliac glands*

(75) Drainage in appendicitis
. A strip of small rubber dam inserted through a stab wound and removed within a few days. Insert another strip in the muscle layers.

Indications
- (a) Perforated appendix
- (b) Gangrenous appendix
- (c) Soiled peritoneum

(76) Appendix mass always treat conservatively
- (a) Resolution: interval appendicectomy
- (b) Abscess: drainage at appropriate time
- (c) Acute exacerbation immediate operation

(77) Haemorrhagic nephritis, B coli urinary infection and renal calculi may be subsequent sequelae of acute appendicitis

(78) Prophylactic anti gas gangrene and anti coli sera are good prophylactics as pre and post operative measures in acute appendicitis

(79) Perforation is a sequela of appendicitis and with its appearance mortality enters the field

(80) *Where there is suspicion of any intra abdominal catastrophe, it is wiser to operate than to court the greater disaster which may be implied in delay*

(81) Three great evidences of appendicitis are
(a) Subjective abdominal pain
(b) Local tenderness
(c) Muscular rigidity

(82) *The site of the local tenderness is a fairly accurate guide to the situation of the appendix*

(83) Pelvic appendicitis is peculiarly liable to be overlooked
(a) Suprapubic pain
(b) Indefinite tenderness
(c) Variable and inconstant rigidity

(84) Children do not tolerate Ochsner regime as readily as adults

(85) In child appendicitis, take the following attitude
(a) If the diagnosis is clear
Advise operation at the earliest opportunity
(b) If there is doubt
Clear it up by operation than to incur the risks entailed in temporising

(86) Cathartics cause increased intra appendicular pressure with an increased risk of rupture and dissemination of infection

(87) *Never give a purge to the child who complains of abdominal pain till appendicitis is excluded*

(88) Suturing of muscles and fascia in the presence of gross infection causes sloughing and mixed or anærobic infection. It is better to leave the wound open with flavine paraffin pack or in mild cases to drain the inter muscular planes

(89) Three basic methods of dealing with the appendix stump
(a) Simple ligature
(b) Ligature, carbolisation and burial
(c) Burial without ligature

(90) '*Fool's paradise stage in acute appendicitis*
(a) Clinic reduction of pain, tenderness and rigidity
(b) Pathology *gangrenous bursting appendix*
(c) Diagnosis (α) History
(β) Right iliac tenderness
(γ) Leucocytosis.

(91) *Acute appendicitis with rigors think of oncoming pylephlebitis* which must be treated by ligature of ileo colic vein to prevent the portal phlebitis

(92) Failure of operation for chronic appendicitis:
- Divide the congenital bands round about the cæcum and right colon

(93) Presence of a stercolith in an appendix is a very important factor in bringing on a severe attack

(94) The rising mortality from appendicitis in children is due to ignorance and procrastination on the part of the parents or to mistaken diagnosis and delay in operation on the part of the medical attendant.

(95) If parents were educated to seek medical advice on the [illegible]

(96) If nausea, vomiting and fever precede pain, it is probably not appendicitis (Murphy)

(97) *Appendico respiratory syndrome*
  (*a*) Respiratory disease simulating appendicitis
  (*b*) High appendicitis simulating basal respiratory disease
  (*c*) Respiratory complication of appendicitis
  (*d*) Associated respiratory disease and appendicitis.

(98) The course of appendicitis is very rapid in children and perforation may occur within 12 hours

(99) Appendicitis in childhood
  (*a*) Rapid course
  (*b*) High mortality
  (*c*) Mistaken diagnosis respiratory syndrome
  (*d*) Delay in treatment
  (*e*) Low resistance

(100) Urine suppression with chloride œdema results from injudicious use of intravenous saline

(101) *In every case of appendicular perforation with spreading peritonitis, pass a de Pezzer tube into the caecum or appendix stump*

(102) *Any acute attack of abdominal pain should never be treated over a telephone or through a proxy—least of all by ordering a purgative*

(103) If any doubt remains in the differential diagnosis between appendicitis and mesenteric lymphadenitis it is infinitely wiser to operate than to risk the disaster of overlooking acute appendicitis

(104) 64% of peritonitis in children are due to acute appendicitis

(105) *Be very careful in palpation of acute appendicitis or appendicular abscess, lest it may burst*

(106) *Hyperæsthesia means tension in appendix;* it denotes that the appendix is likely to perforate at any time, though not perforated upto the time of its elicitation.

(107) *Pain of acute appendicitis rarely begins in the right iliac fossa*; it begins usually round about the umbilicus or in the epigastrium and settles down secondarily in the right iliac fossa

(108) *In every case of abdominal pain in children, exclude worms before any surgical diagnosis is made*

(109) *Passing a drainage tube via an appendix incision into the pelvis is most condemnable* due to hæmorrhage from pressure necrosis of external iliac artery

(110) *McBurney's incision should be reserved for interval cases Battle's incision will suffice for all early acute cases and for those cases in which diagnosis is in doubt especially in females Except where a general exploration is necessary the oblique muscle cutting Morison incision is better than any others for appendicular abscess*

CHAPTER VII

THE RECTUM AND THE ANAL CANAL

(I) CONGENITAL ABNORMALITIES:

(1) RECTAL MALFORMATIONS

(A) *Non or ill-development of proctodeum:*

(1) No trace of anal opening
(2) Anal depression with no trace of rectum
(3) Anal depression with impulse on straining
(4) Complete septum at the level of anal sinuses
(5) Perforated septum at the anal sinuses
(6) Stricture at the ano rectal junction

(B) *Non or ill development of allantoic gut:*

(1) Rectum ending blindly at the prostate or cervix
(2) Fibrous cord between high rectum and procto deum

(C) Persistence of cloacal communication:

Clinic Rectum opening into uro genital sinus
(1) Males (*a*) Bladder
(*b*) Urethra
(*c*) Perineum
(2) Females navicular fossa

Path Imperfect formation of septum between rectum and uro genital organs

Clinic *Of rectal malformations*
(1) Ano rectal stricture or septum
(2) Large gut acute obstruction
(*a*) Within first three days of birth
(*b*) Prominent distension
(*c*) Absent defæcation
(*d*) Local examination
(3) Recto vaginal fistula
(*a*) Absence of anus at normal site
(*b*) *Rectal opening in navicular fossa*

Diag (A) Differentiate from
(*a*) Duodenal septum
(*b*) Ileal atresia
(*c*) Volvulus neonatorum
(B) Determine whether the rectum is near or far
(*a*) Impulse on crying
(*b*) X Ray in reversed position
(*c*) Aspiration not deeper than ·5"

Treat. (1) Anal septum
: **Cruciate incision** → digital dilatation

(2) Anal depression
+ Impulse on straining
+ Aspiration positive
} : **Perineal anus**

(3) No trace of rectum
+ Aspiration negative
+ Condition advanced
} : **Left inguinal colostomy**

(4) Recto-vaginal fistula
Stone's anal transplantation through intact levator ani (Med Ann 1938)

Sequelæ *Of perineal anus*
(1) **Stricture**
(2) **Incontinence**
(3) **Prolapse**

(2) POST-ANAL ABNORMALITIES

(A) Post sacrococcygeal

(*a*) Fovea coccygea
Syn Post-anal dimple
Clinic Blind pit beneath the tip of the coccyx
Site Posterior to the sacrum and coccyx

(*b*) Post anal dermoid or sinus
Syn Pilonidal cyst or sinus
Etio Congenital
Age Between 17 and 30
Cause (*a*) Sequestration dermoid
(*b*) Lack of closure of neurenteric canal
Path (1) Squamous epithelial lining
(2) Contain hair
Site (*a*) Post anal
+ (*b*) Midline
+ (*c*) Posterior to sacrum and coccyx
Clinic (1) Tender swelling
or (1) Sinus (*a*) Lined by skin
(*b*) Discharging pus and hair
(2) Site (*a*) Midline
(*b*) Posterior to sacrum and coccyx
Diff diag Fistula in ano
Compl Inflammation → abscess
Treat (1) Excision and drainage
(2) Excision and packing

(B) Pre-sacrococcygeal

(*a*) Cysts
Origin (α) Perineal dermoids
(β) Neurenteric canal
(γ) Post anal gut

(*b*) Tumours Teratomata

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(γ) Post anal gut

(b) Tumours Teratomata

(II) RECTAL TRAUMA:

(I) INJURIES OF THE RECTUM

Etio (A) **Impalement**
(B) **Split perineum:**
(a) Child birth
(b) Pillion rider's accident
(C) **Faulty enema: Glass nozzle**
(D) **Sigmoidoscopy**
(E) **Compressed air rupture**
(F) ***Gunshot wounds***

Path (1) **Extraperitoneal:**
↓ (a) Periproctitis
↓ (b) Pelvic cellulitis
(2) **Intraperitoneal.**
(a) With no prolapse } of intestines
(b) With slight prolapse } of intestines
(c) With complete prolapse } of intestines
(3) **Association with trauma to other viscera:**
(a) Bladder
(b) Intestines

Clinic (1) History
(2) Lower abdominal tenderness
(3) Local examination

Compl (1) Periproctitis → pelvic cellulitis
(2) Peritonitis
(3) Internal fistula
(a) Recto vesical
(b) Fecal cystitis

Treat (A) **Rectal exploration** ·
(a) Speculum and finger or probe
↓ (b) Cutting the sphincter upto coccyx
+ (c) Free incisions and drainage
(B) **Exploratory laparotomy**
Ind (a) Penetration of more than 6"
(b) Slightest abdominal tenderness
Tech (1) Exploration
↓ (2) Suture
↓ (3) Drainage
↓ (4) Temporary inguinal colostomy
or (4) Rectal tube
(C) **Suprapubic cystostomy:**
Ind Tear into the bladder
Tech (a) Suprapubic cystotomy
↓ (b) Trans vesical suture of the rent
↓ (c) Cystostomy
+ (d) Rectal tube

(2) FOREIGN BODIES RECTUM

Etio. (a) Lunatics
(b) Sexual perverts
(c) Treatment of prolapse
Treat (1) Rectal extraction (Plaster of Paris method)
(2) Laparotomy → bimanual extraction

(III) RECTAL INFLAMMATIONS: Proctitis

(1) CATARRHAL

Etio (A) **Primary**: Local causes
Fæcal impaction, hæmorrhoids
(B) **Secondary**: Neighbouring causes
(a) Pelvic appendicitis
(b) **Pelvic abscess**

Clinical types (1) Acute
(2) Chronic
Clinic (a) Rectal tenesmus
(b) Muco pus per anum
(c) Reflex uro genital symptoms

(2) DIFFUSE SEPTIC AND GANGRENOUS PROCTITIS

Etio (1) Trauma
(2) Post operative acute infections anærobic
(3) Rectal prolapse with strangulation
Path Diffuse gangrenous rectum and peri rectum
Treat (1) Wide incisions and drainage
(2) Hydrogen peroxide
(3) Mag sulph-glycerine packs
(4) Anti-gas gangrene serum

(3) SPECIFIC PROCTITIS

(A) Gonorrheal microscopical exam of discharges
(B) Chancroid
(a) Women
(b) Infection from vulva
(c) Peri-anal skin
(d) Microscopic exam
(C) Diphtheritic
(a) Membrane formation
(b) Microscopic exam
(D) **Dysenteric**. (1) Examine the stools
(2) Proctoscopy
(E) **Tuberculous**:
Etio (a) Secondary to phthisis
(b) Primary
Varieties (1) Tuberculosis cutis ani hypertrophic
(2) T B. ulcers of rectum and anal canal
(3) Diffuse T.B ulceration of rectum

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(D) **Dysenteric** (1) Examine the stools
(2) Proctoscopy

(E) **Tuberculous**.

Etio (a) Secondary to phthisis
(b) Primary

Varieties (1) T [illegible]
(2) [illegible]
(3) [illegible]

(4) **Tuberculous ischio rectal abscess:**
(a) Idiopathic
(b) Subacute or chronic
↓ (5) **Tuberculous fistulæ in-ano:**
(a) Multiple
(b) Recurrent
(c) Phthisis present or absent

Treat (A) Secondary
Leave alone
(B) Associated
(a) Excision
+ (b) Sanatorium anti tuberculous treatment
(C) Primary
Scraping, cautery or excision

(F) **Syphilis.**

Varieties (1) **Primary:**
Indolent indurated fissure
(2) **Secondary:**
(a) Mucous patches
(b) Condylomata
(c) Multiple fissures
(3) **Tertiary:** Local and diffuse
(a) Ulcerations and stricture
(b) Fistula
(c) Fournier's ano rectal syphiloma

Signs (a) Wassermann or Kahn
(b) Therapeutic

(G) Lymphogranuloma inguinale

Path Primary in genitalia
Dense peri rectal fibrosis
No involvement of mucous membrane

Clinic (a) Long progressive history
(b) Site 3 8 cms. above the anus
(c) Infiltrating rubber like consistency
(d) Intact mucous membrane
(e) Fistulæ below the stricture

Symp (1) Blood or pus per anum
(2) Painful defæcation
(3) Progressive constipation

Diag Frei's skin test

Compl (a) Stricture rectum
(b) Fistulæ in-ano

Treat (A) Local
(a) Left inguinal colostomy
↓ (b) Resection
or (c) Stripping the rectal mucosa
or (d) Preliminary colostomy
↓ (e) Treatment of fistulæ

(B) Specific Intravenous tartar emetic
5–15 grs. in 10 c cs sterile water
At weekly intervals

(4) PARASITIC PROCTITIS
(A) Thread worms
(B) Bilharziasis (a) Papillomatosis
(b) Prolapse
(c) Multiple fi tula in ano
Treat Intravenous tartar emetic therapy
(See above)

(5) TRAUMATIC
(a) Fæcal impaction
(b) Abuse of enemata
(c) Foreign bodies

(6) CRYPTITIS
Etio Site (a) Between the columns of Morgagni
+ (b) Above the valves of Ball
Clinic (1) Obscure dull local pain
(2) Proctoscopy
Compl Ischio rectal abscess → fistula in ano

Clinical features Of rectal inflammations
(a) Rectal tenesmus
(b) Anal muco pus
(c) Reflex genito urinary symptoms
(d) Proctoscopy

Treatment Of rectal inflammations
(A) Local
(a) Astringent and antiseptic irrigations
Condy s fluid
(b) Demulcent and soothing instillations
Olive oil
(c) Local applications
Ung gallæ cum opio
(B) Specific (a) Anti syphilitic
(b) Anti tuberculous
(c) Anti dysenteric

(IV) RECTAL ULCERS

(1) TRAUMATIC
(a) Foreign bodies
(b) Lacerations
(c) Post operative
(d) Obstetric

(2) FOLLICULAR

(3) STERCORAL
Etio Fæcal impaction
Site Rectal sinuses

Clinic Chronic diffuse ulcers
Compl *Ischio rectal abscess → fistula in ano*

(4) CHRONIC DIFFUSE ULCERATION
Etio Pyococcal
Clinic Morning diarrhoea with muco pus
Compl (a) Intestinal obstruction
(b) Perirectal suppuration → fistula
(c) Distant chronic sepsis arthritis

(5) SPECIFIC
(a) Tuberculous
(b) Syphilitic
(c) Dysenteric

(6) POST RADIUM
Etio Radium in pelvis (Carcinoma Cervix)
Time One year after radiation
Path (A) Intrinsic (a) Proctitis
(b) Ulceration pseudo malignant
(B) Extrinsic (a) Periproctitis
(b) Ulceration + induration
Clinic (1) History of radium implantation
(2) Slight tenesmus
(3) Anal muco-pus
(4) Pseudo-malignant ulcer at cervical level
or (4) *Peri rectal induration*
Diff diag Carcinoma rectum
Compl (a) Stricture rectum
(b) Recto-vaginal fistula
Treat (1) Stoppage of radium implantation
(2) Saline wash outs
(3) Liquid paraffin instillations
(4) Left inguinal colostomy
(5) Presacral sympathectomy

(7) MALIGNANT ULCER (See Carcinoma Rectum)

Clinical features Of rectal ulceration
(a) Signs of proctitis passage of muco pus
(b) Proctoscopy

Complications Of rectal ulceration
(1) Stricture
(2) Peri rectal suppuration
(3) Fistula in ano

Treatment Of rectal ulceration
(A) Conservative
(a) Local (α) Irrigations
(β) Instillations
(γ) Applications
(b) Specific

(B) Operative
- (a) Curetting
- (b) Excision

Contraind (α) Peri rectal suppurations
(β) Fistulæ or sinuses

- (c) Left inguinal colostomy

Ind (α) Complications
(β) Later stages

(V) RECTAL STRICTURES

Def Permanent abnormal narrowing of rectal lumen

Etio (A) **Primary**
- (1) **Congenital** Ano rectal abnormalities
- (2) **Post operative** Any ano rectal operation
- (3) **Non specific ulcerative**
  - (a) Traumatic ulcer
  - (b) Chronic diffuse ulceration
- (4) **Specific**
  - (a) Syphilis
  - (b) Dysentery
  - (c) Lymphogranuloma inguinale
- (5) **Neoplastic** Carcinoma rectum

(B) **Secondary**
- (1) Inflammation } of surrounding tissues
- (2) New growth }

Sites (1) Anal margin
(2) 2" from anal margin
(3) Upper rectum

Varieties (A) **Linear or annular**

Site Anal orifice or anal canal
Cause (a) Post traumatic
(b) Post operative

(B) **Tubular**

Etio Parous women
Site Level of peritoneal reflection
Cause (a) Local tissue destruction
(α) Post operative
(β) Ulcerative
(b) Chronic inflammation
(α) Syphilis
(β) Chronic metritis
(γ) Chronic pelvic cellulitis

Path (1) Diffuse mucous submucous and muscular infiltrations
↓ (2) Fibrous contraction

Clinic: (A) Symptoms:

- (1) Frequent and urgent desire for defæcation
- (2) Tape like fæces: anal stricture
- (3) Blood + mucus + pus: per rectum
- (4) Faecal impaction + abdominal distension
- (5) General toxæmia
- (6) Pressure symptoms
  - (a) Sciatica
  - (b) Œdema of lower extremities

(B) Signs

- (1) Inspection (a) Peri anal scarring
  - (b) Fissures, fistula
- (2) Palpation
- (3) Procto sigmoidoscopy

Diff diag

- (1) Simple proctitis
- (2) Rectal ulcerations
- (3) Rectal infections
- (4) Fistulæ-in ano
- (5) Rectal new growths

Compl

- (1) Proctitis → periproctitis → peri rectal abscesses → **fistulae-in ano**
- (2) **Fissures**
- (3) **Haemorrhoids**
- (4) Intestinal obstruction
- (5) Intussusception rectal

Treat

(1) **Dilatation:**

Ind (a) Prophylactic post operative strictures
. congenital strictures
(b) Early non complicated cases

(2) **Linear proctotomy → dilatation:**

Ind Low strictures

(3) **Excision of the stricture:**

Ind (a) Malignancy
(b) Inveterate local cause

(4) **Left inguinal colostomy:**

Ind (A) Preliminary
Intractable, complicated strictures
(B) Permanent
(a) Malignant strictures (inoperable)
(b) Intractable complicated strictures

(1) Linear stricture
(A) *Anal orifice stenosis*
(a) Linear proctotomy
+ (b) Division of external sphincter
+ (c) Firm packing
+ (d) Daily bougie dilatation

(B) *Internal sphincter level stenosis*
Gradual dilatation by (*a*) Finger
(*b*) Bougies
(C) *High rectal stenosis* above 3" from anus
(*a*) *With invagination*.
(α) Previous colostomy
↓ (β) Linear proctotomy
(*b*) *Without invagination*
Bougie dilatation
(2) Tubular stricture
(A) *Local treatment*
(*a*) Gradual dilatation
(*b*) Colostomy → Resection
(B) General treatment
(*a*) Diet and laxatives
(*b*) Rectal olive oil
(*c*) Rectal irrigations
(C) Specific treatment
(*a*) Anti-syphilitic
(*b*) Lymphogranuloma

(VI) PERI-RECTAL SUPPURATIONS:

Etio (1) **Septic:**
(*a*) **Primary:** (α) Trauma
(β) Rectal suppuration
(*b*) **Secondary:** (α) Appendicular abscess
(β) Prostatic abscess
(2) **Specific:**
(*a*) **Tuberculosis:** (α) Rectal
(β) Peri rectal
(γ) Distant
(*b*) **Syphilis:** Bursting gumma
(*c*) Lymphogranulomatous
(*d*) Bilharzial

Sources (1) Skin
(2) Peri proctitis proper ischio rectal cellulitis
(3) **Rectal**
(4) Urethral
(5) Prostatic
(6) **Pelvic**
(7) **Distant: spine, hip**

Anatomy (1) **Subcutaneous:**
(*a*) Boil
(*b*) Suppurating external pile
(2) **Submucous:**
(*a*) Infected mucosal abrasion
(*b*) Suppurating internal pile

(3) **Ischiorectal:**
 (A) **Primary:**
  (a) Skin causes: boils
  (b) Local causes: trauma
  (c) Rectal causes: (1) *Cryptitis*
   (2) Inflamed piles
   (3) Rectal ulcer
   (4) Rectal stricture
  (d) Neighbouring causes.
   (α) Urethral abscess
   (β) Pelvic rectal suppuration
   (γ) Pelvic osteomyelitis
 (B) **Secondary:**
  T B spine or hip
 (C) **Pyæmic**
(4) **Pelvi rectal:**
 Pelvic cellulitis → suppuration
 (A) **Primary:** (a) Post puerperium
  (b) Urine extravasation
 (B) **Secondary:** (a) Prostate
  (b) Parametrium
  (c) Urethra or bladder
  (d) Appendix abscess

Clinic (A) **Acute:**
 (1) Rectal tenesmus + reflex symptoms
 (2) Inability to sit tenderness + dull pain
 (3) **Tender brawny induration**
 (4) General septic toxæmia
 (5) Local examination
  (a) Rectal finger
  (b) Bimanual palpation
  (c) Proctoscopy
(B) **Chronic:**
 (1) Tender swelling
 (2) Primary tuberculous focus
(C) **Pyæmic.**
 In any unexplained fever in a case of primary *septic focus, examine ischiorectal fossae*

Compl **Fistula in-ano**

Treat (A) **Conservative:**
 (1) Regulate defæcation
 (2) Hot hip baths
 (3) General sulphonamides
  tin and manganese
(B) **Operative:** Incision and drainage
 (a) ⊢ or crucial incision
 ↓ (b) Excision of flaps
 ↓ (c) Breaking down septa by finger

(*d*) Dilatation of levator ani opening
If any (in pelvi rectal cases)
(*e*) **Never open by Hilton's method**

(C) **Post operative:**
(1) Flavine, eusol or mag sulph applications
(2) No packs or plugs
(3) Hip baths anti septic or hypertonic
(4) Anti gas gangrene serum
If bubbles of gas

(VII) FISTULA-IN-ANO:

(I) SIMPLE FISTULA-IN-ANO

Def A suppurating track lined by granulations opening into the rectum and on the skin

Varieties: (A) *Extent*
(1) **Complete**
(2) **Incomplete**
(*a*) **Blind external** Cutaneous
(*b*) **Blind internal** Mucous
(3) **Horse shoe**
Both ischio rectal fossæ.
(4) **Watering can**
Multiple external openings

(B) *Anatomical*
(1) **Subcutaneous**
(*a*) Blind external
(*b*) Blind internal
(*c*) Complete
(2) **Submucous**
(*a*) Blind external
(*b*) Blind internal
(*c*) Complete
(*d*) Bilateral
(3) **Intermuscular**
Blind internal
(4) **Para-rectal**
(*a*) Blind internal
(*b*) Complete
(*c*) Bilateral
(5) **Sub sphincteric**
(*a*) Blind internal
(*b*) Complete
(*c*) Bilateral horse shoe anterior
(*d*) Through the external sphincter
(*e*) Below the external sphincter

(6) **Ischio-rectal:**
- (*a*) Blind external
- (*b*) Blind internal
- (*c*) Complete
- (*d*) Bilateral: horse shoe posterior

(C) *Etiological:*

(1) **Congenital:** Post anal sinus

(2) **Traumatic:** Obstetric recto-vaginal

(3) **Septic:** (*a*) Cryptitis
(*b*) Rectal ulcerations

(4) **Specific:** (*a*) Tuberculous
(*b*) Syphilitic
(*c*) Lymphogranulomatous
(*d*) Bilharzial

(5) **Complicating:** (*a*) Stricture rectum
(*b*) Neighbouring abscess

(6) **Malignant**

(7) **Peri-rectal suppurations:**
- (*a*) Peri anal → Subcutaneous
- (*b*) Ischio rectal → Ischio rectal
- (*c*) Pelvi rectal → Para rectal
- (*d*) Peri rectal → Internal compound
- (*e*) Submucous → Submucous

Pathology (*a*) Appearance of initial septic focus
↓ (*b*) Septic lymphangitis or phlebitis
↓ (*c*) Suppuration abscess
↓ (*d*) Evacuation of pus
(α) One way incomplete fistula
(1) External
(2) Internal
(β) Both ways complete fistula

Morb anat (1) **External opening.**
Size, position, number, character

(2) **Internal opening:**
- (*a*) 3" above anus para rectal
- (*b*) Just above Hilton submucous
- (*c*) At valves of Morgagni subsphincteric
- (*d*) Posterior midline between sphincters.
  - (α) Ischio-rectal
  - (β) Horse shoe
- (*e*) Anywhere between sphincters.
  Intermuscular

(3) **Main track:**
Straight, curved, tortuous branched

(4) **Offshoots:** Along lymphatic areas

Clinic (1) One or more openings
- (a) Lined by granulations
- (b) Discharging (1) Pus
  - (2) Serum
  - (3) Gases
  - (4) Fæces

(2) History of previous peri rectal inflammations
(3) Occasional acute inflammatory exacerbations
(4) Bimanual palpation induration
(5) Proctoscopy Internal orifice
- (a) Discoloration
- (b) Puckering
- (c) Induration
- (d) Methylene blue test

(6) Presence of etiology
- (a) Local rectal
- (b) Regional bone
- (c) Distant spine or hip
- (d) Systemic syphilis T B etc

Compl (1) Exacerbation of suppuration
↓ (2) Multiplication of orifices
↓ (3) Malignancy

Treat (1) Treat the etiology
(2) Rectal pre operative hygiene
(3) Operation
- (A) **Lay open the tracks**
- (B) **Excision of the whole track**

(a) Blind external
- (α) Lay open and scrape
- or (β) Turn it into complete and excise

(b) Blind internal
Turn it into complete and excise

(c) Complete sub or inter muscular
Excise the whole track

(d) Supra muscular
- (α) Lay open and excise the sub muscular part
- \+ (β) Dilate the communication and drain the supra muscular part
- ↓ (Υ) Seton for the supra muscular part

(e) Horse shoe
Open out both the ischio rectal fossa

(f) Watering can
- (α) Unite all outer orifices
- ↓ (β) Lay open the main track

Post treat (1) Remove the pack on 5th day

(B) Complete pararectal

Opening (a) External 1·5 from anal margin
Near transverse anal line

(b) Internal Supra levator

Track Straight up 4"

Diagnosis Probe not felt throughout

(C) Bilateral pararectal

Opening (1) Internal

(a) Primary supra levator

(b) Secondary Posterior midline
Between sphincters

(2) External

(a) Primary symmetrical
1·5 from anus

(b) Secondary

Tracks (1) Main longitudinal

(2) Bilateral supra levator

(3) Bilateral ischio-rectal

(4) Submucous

Clinic (1) Pelvic cellulitis

↓ (2) High supra levator peri rectal abscess

↓ (3) Ischio rectal abscess

↓ (4) Primary external opening

↓ (5) Secondary external openings

+ (6) Internal openings

(a) High supra levator

(b) Inter-sphincteric

Diff diag (1) Submucous fistula

(2) Ischio-rectal fistula

(3) Pelvi rectal fistula

(4) Pre sacral fistula

Operation (A) Early blind para rectal fistula
⊢ incision into the abscess
Through the ischio-rectal fossa
With finger in the rectum

(B) Blind internal → ischio rectal fistula

(a) ⊢ incision and evacuation of pus

↓ (b) Dilatation of levator aperture

(C) Complete para rectal fistula

(a) Join all ischio rectal offshoots

(b) Dilate the levator aperture

(D) Bilateral para rectal

(a) Open the tracks in both ischio rectal fossae

(b) Division of coccygeus

(5) *Subsphincteric ano-rectal fistula in-ano*

Varieties (A) Blind internal subsphincteric

Cause . (a) Septic Morgagni
(b) Septic fissure

Opening At Morgagni

Track (a) Deep to external sphincter
(b) Between the sphincter fibres
(B) Complete subsphincteric
Cause (a) Septic Morgagni
(b) Septic fissure
Opening (1) External
1.25 from anal margin
(a) Anterior anterior to trans anal line
(b) Posterior posterior to trans anal line
(2) Internal
(a) If anterior external opening
Opposite to it
(b) If posterior external opening
Posterior midline
Inter-sphincteric
Track (1) Anterior to trans-anal line
Straight
(2) Posterior to trans anal line
Curved
Off-shoots Present
(C) Bilateral subsphincteric fistula
Synonym Anterior horse shoe
Path Subcutaneous bilateral off shoots from the terminations of the main track of subsphincteric fistula
Opening (a) External
Outer margin of ext sphinct
(b) Internal
Inter sphincteric
Track (a) Main
Radial deep to ext. sphinct
(b) Secondary
Horse shoe subcutaneous
Diff diag (1) Subcutaneous fistula in ano
(2) Urinary fistula
Operation (A) Anterior fistulæ
(a) Division through and through over a probe-director
(b) Relieving cuts
(B) Posterior fistulæ
As in ischio rectal fistula
(6) *Ischio rectal fistula in ano*
Path (a) Sepsis in the anal canal
Posterior inter-sphincteric
↓ (b) Septic lymphangitis
↓ (c) Ischio-rectal abscess
↓ (d) Ischio rectal fistula
Varieties (A) Blind external ischio rectal
Cause Ischio-rectal cellulitis
Opening 2" from anal margin
On the trans anal line
Track Curved posteriorly

(B) Blind internal ischio rectal

Cause Anal canal mucosal sepsis

Opening Posterior midline intersphinct.

(C) Complete ischio rectal

Cause Anal sepsis

Opening (1) External

Multiple over ischio rectal area

(2) Internal

Posterior midline intersphinct

Track Curves back

Off shoots Present

(D) Bilateral ischio rectal

Synonym Posterior horse-shoe

Cause Anal sepsis

Opening (1) External

Multiple one or both sides

(2) Internal

Posterior midline intersphinct

Track Curved on both sides

Off-shoots Present

Diag (1) External opening

(*a*) Posterior to trans anal line

(*b*) 2" from anal margin

(2) Internal opening

Posterior midline intersphinct

(3) Ischio rectal induration

Operation (A) *Blind external*

(*a*) Lay open the main track and off shoots

(*b*) Relieving cuts

(*c*) Turn into complete if necessary

(B) *Blind internal*

(*a*) Incise from outside

(*b*) Treat as complete fistula

(C) *Complete*

(*a*) Lay open the curved main track

Over repeatedly passed probe-director

(*b*) Lay open the off shoots

(*c*) Relieving cuts

(D) *Bilateral*

Two stage operation

(*a*) Lay open the tracks on both sides

↓ (*b*) Lay open the main track

+ (*c*) Look for submucous extension

(II) COMPLICATED ANO-RECTAL FISTULA

(A) Recto-vesical fistula :

Etio (*a*) Congenital

(*b*) Traumatic rectal wounds

(c) Inflammatory: pelvi rectal
(d) Carcinomatous

Clinic: (1) Urine per rectum
(2) Flatus and fæces per urethra

Compl: Ascending urinary infection

Treat: (1) Colostomy + cystostomy
↓ (2) Local separation

(B) Recto-urethral fistula:

Etio: (a) Congenital
(b) Urethral sepsis
(c) Carcinomatous

Treat: (1) Treat the etiology
(2) Preliminary cystostomy
↓ (3) Plastic operation

(C) Recto-vaginal fistula:

Etio: (a) **Congenital**
(b) Trauma · **Parturition**
(c) Specific
(d) Carcinomatous

Clinic: Fæces per vaginum

Treat: (1) Preliminary colostomy
↓ (2) Plastic operation

(D) Recto-intestinal fistula:

Etio (a) **Appendicular abscess**
(b) Diverticulitis
(c) Tuberculous intestines
(d) Carcinoma

Treat (1) Leave it alone
(2) Plastic operation

(VIII) ANAL FISSURE:

Def: A longitudinal linear tear of the muco cutaneous lining of the anal canal

Etio (a) Cause Trauma
Fæcal abrasion
(b) Sites (α) **6 o'clock**
(β) 12 o'clock
Due to (1) Ano rectal angle
(2) Deficient muscular support
(3) Valves of Ball
(c) Predisposers.
(1) Non supple muc. mem.
: Due to fibrosis: (α) Inflammatory
(β) Post-operative
(2) Spasm of the sphincter ani

(3) Chronic constipation
(4) Specific diseases: (a) Tuberculosis
(b) Syphilis
(5) Anal growths

Symptoms: (1) **Excruciating and prolonged pain:**
: At the time of defæcation
(2) Tapered and fragmented stools
(3) Reflex genito-urinary symptoms

Signs: (a) **Sentinel pile:** (if of some standing)
(b) **Anal spasm**
(c) Examination: under novocain infiltration

Diff diag: (1) Syphilis of the rectum
(2) Submucous fistula
(3) Ano rectal polypi
(4) Blind internal fistula

Treat: (A) **Conservative:**
(a) Laxatives: liquid paraffin H S
(b) Local (α) Rectal instillations: olive
(β) Rectal applications percain
(γ) Injections: into the sphinct
(1) Novocain: 2%
↓ (2) Proctocaine: 5–8 c.cs.

(B) **Operative:**
Ind (a) Failure of conservatism
(b) Sentinel pile → dorsal fistula
(c) Associated abnormalities

Tech. (1) **Sphincter-stretching:** Recamier
(a) General anæsthesia
↓ (b) Digital stretching
(2) **Sphincterotomy:** Boyer
: Division of external sphincter
: At the junction of middle & post thir
(3) **Pectenotomy:** Miles
(a) Anæsthesia. infiltration 1" behind anus
↓ (b) Eversion of lower anal canal
By index finger
↓ (c) Incision through anal mucosa
In right posterior quadrant
↓ (d) Division of pearl white pecten band
↓ (e) Pack the pecten wound
(4) **Excision:** Gabriel
of (a) Fissure
+ (b) Sentinel pile
+ (c) Skin triangle.
. Twice as long as muc. mem.

After-treat: (a) Pain: morphia or omnopon
(b) Dressings:
(α) External:
: B D. and after each evacuation
(β) Packing · removal on 4th morning
(c) Bowels:
(α) Purge: 4th morning
(β) Laxative: every night

(IX) HAEMORRHOIDS:

Varieties: (1) **External Piles: Covered by skin**
(A) **Dilated anal vein:**
Etio: Straining during defæcation
Symps: Swelling and fullness
Signs: (1) Redundant peri anal skin
(2) Fullness round the anus
(3) Spasmodic and thick sphincters
(4) Ballooning of the rectum
Treat: (1) **Conservative:**
(a) Aperients and laxatives
(b) Local emollients
(2) Operative:
(a) Complete division of pecten band
(b) *Division of external sphincter*
(c) Removal of internal pile
(d) Removal of skin triangle
(e) Pack
(B) **Thrombotic pile:** Venous rupture
Path: Extravasation of blood due to rupture of a peri-anal vein by violent straining
Clinic. (a) History of **straining** at defæcation
(b) Painful, tender, **peri anal swelling**
(c) Painful defæcation
Sequelæ. (1) Absorption
(2) Fibrosis
(3) Ulceration → blind external fistula
(4) Abscess · peri-anal
Treat: (A) **Conservative:**
(a) Bedtime aperient
(b) Lotion: frequent applications
℞ Liq plumbi subacetat. oz ½
Spt. vini. rect. : oz 1
Glycerine ; oz ½
Aqua rosæ . oz 10
↓ (B) **Operative:**
(a) Incision → evacuation of clot
(b) Excision of skin ellipse:
↓ Enucleation of clot with capsule
(c) T or + incision: if inflammation

(C) Cutaneous peri-anal folds:

Etio (a) Chronic constipation
↓ (b) Skin irritation
+ (c) Skin traumatisation
+ (d) Skin inflammation
↓ (e) Skin hypertrophy + fibrosis

Path Hypertrophic cutaneous peri anal rugæ

Clinic (a) Pruritus
(b) Inspection

Treat (1) Treat the constipation
(2) Wash without soap
(3) Clean with olive oil
(4) Apply . (A) (at night) { Zinc oxide zii; Lin camphor ziii; Vaseline ozii }
(B) (at day time) { Zinc oxide ziii; Pulv camphor zii; Pulv amyli ozii }

(D) Sentinel pile:

Œdematous tag of the skin at the lower end of a fissure in ano

(2) Internal Piles: Covered by mucous membrane

Def: Dilatation, tortuosity, varicosity and hæmangiomatous multiplication of hæmorrhoidal vessels at their terminations in anal submucosa, just above the Hilton's white line

Etio. (a) Primary . heredity in young people
(b) Secondary sedentary men of 40—60

Pre disp: (1) **Primary:** Habitual constipation
(a) Gravity
(b) Muscular obstruction
(c) Loose support
(d) Straining

(2) **Secondary:** Symptomatic
(a) **Local** · Carcinoma, stricture
(b) **Intermediate:** Pregnancy, tumour
(c) **Hepatic** · Cirrhosis
(d) **Prehepatic:** Heart, lungs
(e) **General:** High blood pressure

Pathology:

Morb anat. Each internal hæmorrhoid consists of .
(a) Central termination of sup hæm art,
(b) Dilated, tortuous veins
(c) Fibrous tissue

Number. Maximum: (a) Four right
(b) Three left

Sites: (1) **Primary hæmorrhoids:**
- (a) Right anterior: 11 o'clock
  : Right anterior quadrant
- (b) Right posterior: 7 o'clock
  : Right posterior quadrant
- (c) Left lateral: 3 o'clock

(2) **Secondary hæmorrhoids:**
- (a) Two with right posterior:
  - (α) Right secondary: 9 o'clock
  - (β) Posterior secondary: 6 o'clock
- (b) Two with left primary:
  - (α) Left post. second.: 4 o'clock
  - (β Left ant. second.: 2 o'clock
- (c) Anterior: 12 o'clock

Groups: (1) Right anterior primary: 11 o'clock
+ Anterior secondary: 12 o'clock

(2) Right posterior primary: 7 o'clock
+ (a) Right secondary: 9 o'clock
+ (b) Posterior secondary: 6 o'clock

(3) Left primary: 3 o'clock
+ (a) Left post. secondary: 4 o'clock
+ (b) Left ant. secondary: 2 o'clock

Clinical stages:

(1) *First stage:*
: **Variable bright red hæmorrhage**
: Just before or after defæcation

(2) *Second stage:*
(a) Protrusion with spontaneous reduction
(b) Inspection on straining

(3) *Third stage:*
: Continuous, persistent protrusion

(4) *Associated sign:*
: **Pecten band:**

Clinic (a) Incomplete evacuation
(b) Small fæcal masses

Path Deposit of fibrous tissue circularly disposed in the submucosa of the anal canal, between anal mucous membrane and the ext. sphincter, caused by passive congestion of hæmorrhoidal vessels.

Associated Internal hæmorrhoids

Compl Strangulation of piles

Diff. diag: (1) Rectal polyp
(2) Intussusception
(3) Rectal prolapse

Diagnosis Proctoscopy

Association (A) Local.

(1) Proctitis
(2) Stricture rectum
(3) Fistula in ano
(4) Fissure in ano
(5) Rectal growth

(B) Distant

(a) Primary cases
(1) Varicocele
(2) Saphenous varicosities

(b) Secondary cases
(1) High growth
(2) Pregnancy
(3) Cirrhosis liver
(4) Hypertrophied heart
(5) High blood pressure

Compl (a) Excessive hæmorrhage → secondary anæmia
Painless bright red unmixed
(b) Prolapse intermittent → continuous
(α) Acute strangulation
(β) Chronic interno external pile
(c) Thrombosis painful tender swelling
(d) Inflammation → fibrosis or ulceration
(e) Infection → abscess → fistula in ano
(f) Strangulation → sloughing
(g) Portal pyæmia rigors + tender liver
(h) Pruritus ani

Treat (A) *Conservative*

Ind (a) Early cases
(b) Secondary piles

Tech (1) Laxatives
(2) Local emollients
(3) Hot hip baths
(4) Treatment of etiology

(B) *Injection treatment*

Ind (1) **Uncomplicated** internal piles
(2) **Marked bleeding**

Contraind (1) **General**
(a) Cardiac disease
(b) Renal disease
(c) Hepatic disease

(2) **Local**
(a) Fissure-in ano
(b) Fistula in ano
(c) Prolapsed pile or rectum

(*d*) Weak external sphincter
(*e*) Carcinoma rectum
(*f*) Inflamed thrombosed or fibrosed pile

Advant (1) **Ambulatory**
(2) Anæsthesia not needed
(3) Immediate relief
(4) Fewer complications

Disadvant Danger of complications if technique is faulty

Solutions (1) **5% carbolic acid in almond oil**
(*a*) 5 gms of pure carbolic crystals
Melted in water bath
\+ (*b*) 95 c cs of pure almond oil
Boiled in water bath for 30 min
Add the carbolic acid to the almond oil, when cool and shake
or (2) 20% carbolic acid
In equal parts of glycerine and water
or (3) **5% Quinine urea hydrochlor**

Syringe Record 10 c.cs.
With angular needle and bayonet catch

Technique (1) Introduction of proctoscope
(2) Rectal wash out
(3) **Submucous injections**
(*a*) Aspirate before injection
(*b*) *Sites*
(α) **High** 1"-3" above ano rectal line
(i e. at the ano rectal ring)
(β) **Intermediate**
Just above the pedicle of the pile
(γ) **Low** In the substance of the pile
(c) *Quantity* 5 min to 10 c.cs.
Enough to cause pale swelling with striation
(α) High 3-10 c.cs.
10 % sol in almond oil
(β) Intermediate *2-3 c cs*
15% sol in almond oil
(γ) Low 3-7 min
20% sol in glycerine
(*d*) *Sittings*
Four sittings at weekly intervals
(α) One quadrant at each sitting
or (β) Two piles at each sitting

After treat Tablespoon of liquid paraffin B D

Compl. (1) Painful thrombosis
Injection into a vein
(2) Painful ulcer
Injection into muc mem
(3) Periproctitis
Injection into peri rectal tissues
(4) Fissure in ano
(5) Failure

(C) *Operative treatment*

Ind (1) Primary piles
(2) Uncontrollable recurrent bleeding
(3) Uncontrollable protrusion
(4) Associated local conditions
(5) Absence of inflammation

Contraind (1) Secondary piles
(2) Inflamed piles
(3) Early stages

Pre-oper (a) Light diet and restricted smoking
(b) Purge calomel → saline
(c) Mist bismuth Co T D S
(d) Colon washes
(α) Previous morning
(β) Previous evening
(γ) Same morning 3 hours before
(e) Picric acid preparation of perineum
(f) Anæsthesia low spinal or local

Operations (1) **Ligature of piles:** Salmon
(2) **Ligature and excision:** Milligan
(3) **Clamp → excision → suture**
(4) Clamp → cautery
(5) Whitehead s operation
Tech Removal of whole pile bearing area
Compl. (a) Sensory incontinence
(b) Stricture

Tech (1) Salmon s ligature operation
(a) Incision of pecten band
(b) Kocher s forceps at primary piles
(c) Application of hæmorrhoidal forceps
(d) Dissection and ligature of piles
(e) Return of strangulated piles in rectum
(2) Milligan s ligature operation (Med Ann 1939)
(a) Catching the pedicle and delivery of three primary piles
(b) Dissection of > shaped skin over external hæmorrhoidal plexus
(c) Exposure of circular band of subcutaneous ext. sphincter

(*d*) Exposure of longitudinal muscle at the inner border of (*c*)
(*e*) *Silk ligature around the pedicle*
(α) Above the pedicle forceps
(β) Including longitud nal muscle
(*f*) Excision of the pile distal to l gature
(*g*) Leave intact at least ½ of anal muc. mem and skin between each pile

Advantages (1) No recurrence
(2) No retraction of pedicle
(3) No skin tags no fissure

After treat (A) **Rectal tube method**
(B) **No rectal tube method**
(*a*) Hypodermic morphia
+ (*b*) Opium mixture

Liq ammon acetat	m. xxx
Tr catechu	m xx
Tr opii	m. x
Tr cardamomi Co	ʒ i
Spt. *chloroformi*	*m x*
Aqua cinnamomi	ad oz i

(1) Every 4 hours on first day
(2) Every 6 hours on second day
(3) Every 8 hours on third day
(4) Every 8 hours on fourth day
↓ (*c*) Saline purge on 5th morning
↓ (*d*) Liquid paraffin every n ght
(*e*) Micturiti n
(α) Restrict flu ds for 24 hours
(β) Do not try for first 24 hours
(γ) Erect po ture
(*f*) Diet (α) Fluids for f r t 4 days
(β) *Ordinary from fifth day*
(*g*) Dressings
External dressings changed
(α) B D
+ (β) After every defæcation
(*h*) *Digitation of the rectum*
From 12th to 20th day

Post. compl (1) **Hæmorrhage** Reactionary or secondary
(*a*) External : on the dressings
(*b*) Internal
(α) Urgent desire to defæcate
(β) Rising pulse
(2) **Retention of urine**
(3) *Chronic non healing ulcers*
(4) Sepsis (*a*) Local abscess
(*b*) Regional fistulæ
(c) Ascending portal pyæmia

(5) **Stricture** · Rectum or anus
↓ (6) Fissure in ano
(7) Incontinence
(a) Sensory in Whitehead
(b) Traumatic injury to sphincters
(8) **Recurrence** Development of new piles

Treatment of prolapsed and strangulated piles

(A) **Conservative**
(a) Morphia + hot bath + Trendelenburg
(b) Local dressing normal saline + adrenalin
(c) Oral liq paraffin + rectal glycerine

(B) **Sphincter relaxation**
Aseptic deep intra sphincteric injection of 10 c cs. of proctocaine

(C) **Sphincter stretching + reduction of pile**
Ind Recent prolapse
Tech (a) Anæsthesia
(b) Stretching of the sphincter
(c) Return the prolapsed pile
(d) Strapping of the buttocks

Treatment of thrombotic pile
Incision and evacuation of clot

(X) PROLAPSE OF THE RECTUM

Def *Protrusion through the anal orifice of parts normally situated within*

Etio (1) **Relaxation of peri rectal support**
Debility convalescence
(2) **Relaxation of sphincters**
(a) Prolapsed piles
(b) Operative trauma
(3) Mobile extra loop of colon congenital
(4) **Straining**
Constipation diarrhœa

Varieties (A) Age (a) Juvenile procidentia
(b) Senile
(B) Extent (a) Partial rectal prolapse
Syn *Prolapsus mucosæ recti*
Varieties (α) Unilateral
(β) Bilateral
(b) Complete rectal prolapse
(c) Colon prolapse
Prolapse of colon through anus
Congenital mobile colon

Morb anat (1) Double tube (with central lumen)
Continuous with anal skin
(except in colon prolapse)
(2) Sometimes peritoneal pouch

Clinic (1) Peri anal dampness
(2) Anal incontinence
(3) **Anal protrusion:**
(a) Partial 2" of muc mem alone
(b) Complete cylindrical mucosal mass with a central lumen, projecting through the patulous anus
(A) Continuous with anal skin
In partial cases
(B) Finger going between in
(a) Complete rectal prolapse
(b) Colon prolapse

Diff diag (1) Prolapsed polypus or growth
(2) Prolapsed pile
(3) Intussusception

Compl (a) Irreducibility
(b) Inflammation
(c) Ulceration
(d) Strangulation
(e) Gangrene
(f) Peri proctitis cellulitis fistulæ
(g) Incontinence
(h) Hernia in ant peritoneal pouch

Treat (1) *Conservative treatment*
(a) Reduction of protruded bowel
(b) Prevention of recurrence
(1) Laxatives
(2) Regulated diet
(3) Rectal olive oil
(4) Rest in recumbency
(5) Recumbent defæcation
(6) Strapping of the buttocks
or (7) Anal purse string around a tube
(c) Toning the sphincter
(1) Exercise
(2) Strychnine
(d) Fattening of the patient
Codliver oil

(2) *Injection treatment*
Ind (1) Incomplete prolapse
(2) No regional infection
(3) Etiology treated
Tech Gaume (Med Ann 1940)
Submucous and muscular injections of 5% quinine and urea hydrochlor
(a) 2 3 minims at each puncture
(b) Circular rows
(c) From apex to base

Solutions (1) 5% quinine and urea hydrochlor
(2) 5% carbolic acid in almond oil

(3) *Operative treatment*.

(A) *Incomplete rectal prolapse*

(1) **Linear cauterisation**
(2) **Ligature of redundant mucosa**
(3) **V excision of muc mem.**
(4) **Whitehead s excision of muc ring**

(B) *Complete rectal prolapse*

(1) **Rectopexy:**

Ind Complete rectal prolapse

Tech (A) Marchant

(a) Incision
Middle of internatal cleft to post anal margin
(b) Separation of coccygeus muscle
(c) Suture of rectal muscularis to sacro sciatic ligament
(d) Suture of coccygeus
(e) Closure with drainage

(B) Lockhart Mummery

(a) Incision
Transverse 2"
Midway between coccyx and anus
(b) Division of ext sphinct and ano-coccygeal ligament
(c) Stripping off of the rectum on three sides
(d) P c pelvi rectal sp ce with gauze
(e) Allow to heal by granulations

( ) **Colopexy:**

Ind (a) Mobile colon loop
(b) Mobile rectum

Tech (a) Incision left paramedian subumbilical
( ) Draw up the colon
(c) Peritoneal incision
On the outer aspect of pelvic colon
(d) Suture of (α) External tenia coli
to (β) Iliac fascia
(e) Suture of peritoneal edges to the colon on both sides of suture (d)
(f) Closure of the abdomen

(3) **Recto sigmoidectomy:** Miles

Tech (a) Spinal anaesthesia
(b) Posture lithotomy with Trendelenburg
(c) Steps
(1) Separation of mucosa from muscularis and its transverse cutting 5" from Hilton's line

(2) Longitudinal opening of anterior peritoneal pouch and reduction of its contents
(3) Transverse division of rectum at (1)
(4) Ligature of the pelvic mesocolon of the prolapsed part
(5) Transverse division of the prolapsed colon
(6) Suture of cut rectum to cut colon.
Muscle to muscle
Mucosa to mucosa
(7) Rectal tube

(C) *Weak sphincter*
(1) **Sphincter plication and suture**
(2) Submucous paraffin injection
(3) Peri anal subcutaneous silver wire

After treat. **Prevent the recurrence of prolapse:**
(1) Avoidance of straining (defæcation)
( ) *Avoidance of gravity (sitting posture)*

XI) NEOPLASMS OF THE RECTUM AND ANUS:

(A) BENIGN
(1) **Adenoma:** Polypus
(2) **Papilloma.** (*a*) Single
(*b*) Multiple
(*c*) Bilharzial
(3) Angioma
(4) Fibroma thrombosed pile
(5) Lipoma
(6) Endometrioma
Clinic (*a*) Cyclic rectal bleeding
(*b*) Submucous induration
(*c*) Biopsy
Diff diag Carcinoma
Treat X Ray sterilisation

(B) MALIGNANT
(1) **Carcinoma:** (*a*) Columnar rectal
(*b*) Squamous anal
(2) **Sarcoma:** (*a*) Round celled
(*b*) Spindle celled
(*c*) Lympho
(3) **Melanoma:** (*a*) Anus
(*b*) Rectum

(1) ADENOMA
Etio (*a*) Juvenile
(*b*) Adult

(1) Primary
(2) Secondary adenomatosis
(α) Single
(β) Multiple adenomatosis

Path Origin in mucosal glands
(a) Sessile
(b) Pedunculated

Clinic Painless hæmorrhage with mucoid discharge

Compl (1) *Prolapse*
(2) Torsion
(3) **Malignancy**

Treat Excision

(2) PAPILLOMA
(A) **Rectal** Mucoid anal discharge
(B) **Anal** Secondary to rectal discharge

(3) ANO-RECTAL CARCINOMA

Etio Age 40–60
Sites (1) Recto sigmoid
Beyond the reach of the anal finger
(2) Ampullary }
(3) Anal canal } felt P R
(4) Anus }

Pre disposers (a) Chronic ulcers
(b) Adenomata
(c) Diverticulitis

Pathology (A) **Columnar celled** Rectal
Irregular proliferation of Lieberkuhn s gland
(B) **Squamous celled** Anal

Spread (1) **Direct extension**
(a) Marginal and surface
↓ (b) *Rectal wall*
↓ (c) **Peri rectal tissues**
↓ (d) Adjacent viscera
↓ (e) Pelvic wall
+ (f) Peritoneum

(2) **Lymph spread**
(a) Intra mural lymphatics *trivial spread*
↓ (b)
↓ (c)
(
(1) Peri anal skin
(2) External sphincter
(3) *Ischio-rectal fossa*
(β) **Lateral Along mid hæm art**
(1) Levator ani
(2) Pelvic peritoneum

(3) Uro genital organs with adnexa
(4) Internal iliac glands
(٢) **Upward: Along sup hæm. art.**
(1) Retro rectal glands
(2) **Pelvic mesocolon**
(3) Paracolic glands
(4) Inferior mesenteric glands
(5) Pre aortic glands
(٤) Inguinal glands: in anal carcinoma
(3) **Blood stream: Right lobe of the liver**

Classification:

(1) **Papilliferous carcinoma:**
: Cauliflower growth
Site: Ampulla and anal canal
Morb. anat: Papilloma with infiltrated base
Path: Local malignancy
Clinic: **Early obstruction**

(2) **Adenoid carcinoma:**
: Malignant ulcer
Site: Ampulla and anal canal
Morb. anat: (a) Flat transverse sessile tumour
↓ (b) Malignant ulcer
Path: Early extra-mural spread
Clinic: (a) **Proctitis**
↓ (b) Late obstruction

(3) **Colloid or mucoid carcinoma:**
Site: Ampulla and anal canal
Morb anat. Colloid or mucoid degeneration
Path: **Extremely malignant**

(4) **Melanotic carcinoma:**
Site Ampulla and anal canal
. Posterior wall
Morb. anat Adenoid carcinoma with pigmentation
Path. Early malignant
: Early widespread metastases
' Recurrent

Clinical groups

(A) **Recto-sigmoid carcinoma: 63%**
(1) *Papilliferous Stenosis syndrome*
(a) Diarrhœa with mucus and blood
↓ (b) Intestinal obstruction
(2) *Adenoid : Stenosis syndrome*
. Acute on-chronic intestinal obstruction

(B) **Ampullary carcinoma: 30%**
(a) *Pre-ulcerative stage: Latent*
(1) Symptomless
(2) Sensation of foreign body

(3) Constipation ←→ diarrhœa
(4) Diarrhœa

(b) *Ulcerative Stage Dysenteric syndrome*
(1) Proctitis
(α) Frequency
+ (β) Blood + offensive mucus
(2) Progressive cachexia

(c) *Peri rectal infiltration. Periproctitis*
(1) Frequency + (blood + pus + mucus)
↓ (2) Perirectal suppuration
↓ (3) Fistulæ in ano
+ (4) Cachexia

(d) *Implication of neighbours: Sciatica syndrome*
(1) Intestines intestinal obstruction
(2) Nerves **Sciatica**
Obturator neuralgia
Sacralgia
(3) Veins **Hæmorrhoids**
(4) Viscera uterus prostate bladder

(e) *General secondary carcinomatosis Distant syndrome*
(1) Enlarged liver with jaundice
(2) Ascitis
(3) Œdema of lower limbs
(4) Bony foci

(C) **Anal canal carcinoma · 7%**
(1) *Sensation of foreign body*
(2) **Pain with discharge**
(3) Hæmorrhoids

Signs (1) **Digital exploration:**
(a) Site (α) *Recto sigmoid*
Beyond reach
(β) Ampullary } within reach
(γ) Anal canal }
(b) *Nature of the growth*
(α) *Proliferative*
(β) Ulcerative
(γ) Fibrotic
(c) Consistency
(d) Friability
(e) Mobility
(α) Muc mem over the focus
(β) Focus over peri rectal tissues
(f) Implication of neighbours
(α) Anterior genito urinary
(β) Lateral pelvic wall
(γ) Posterior sacrum

(g) Secondaries :
(α) Glands
(β) Recto vesical pouch
(2) **Procto-sigmoidoscopy :**
(a) Stricture
(b) Ulcer
(c) Tumour
(3) **Biopsy :**
(a) **Broder :** Cell differentiation grades
(b) **Duke :** Spread depth grades

Clinical syndrome
(1) **Obstructive :** *Senile large gut obstruction*
(a) Constipation alternating with diarrhœa
↓ (b) Acute on chronic intestinal obstruction
(2) **Inflammatory :** *Pseudo dysentery*
· Tenesmus + (blood + mucus)
(3) **Tumour :** *Pseudo papillomatosis*
(a) Anal cauliflower growth
\+ (b) Incontinence + (blood + mucus)
(4) **Hæmorrhoids :** *Internal piles*
Internal piles in elderly subjects
(5) **Peri proctitis :** *Fistulæ in-ano*
Multiple fistulæ in ano in seniles
(6) **Pressure or implication :** (A) *Neuralgias*
(a) Sciatica
(b) Sacralgia
(c) Recto vesical fistula
(B) Internal fistulæ
(7) **Distant :**
(a) Liver enlargement
(b) Ascitis
(8) **Latent :**
Unexplained cachexia

Diff diag (1) **Local conditions :**
(a) Proctitis
(b) Ano rectal ulcers
(c) Ano rectal strictures
(d) Ano-rectal specific diseases
(e) Ano rectal growths
(f) Hæmorrhoids
(2) **Abdominal conditions :**
(a) Intestinal obstruction
(b) Ascitis
(c) Liver enlargement
(3) **General conditions :**
(a) Metabolic diseases
(b) Anæmias

Compl (A) **Local:** (a) Obstruction
(b) Ulceration → hæmorrhage
(c) Infection → (a) Periproctitis
↓ (b) Fistulæ
(d) Irritation painful tenesmus
(e) Incontinence
(f) Hæmorrhoids
(B) **Regional**·
(a) Bladder (1) Dysuria
(2) Recto vesical fistula
(b) Vagina recto vaginal fistula
(c) Sacrum sacralgia
(d) Pelvis Sciatica
Obturator neuralgia
(C) **Distant**
(a) Enlarged liver
(b) Ascitis
(c) Œdema lower extremities
(D) **General**
Cachexia decubitus
(E) **Intercurrent**
(a) Pulmonary affections
(b) Heart failure
(c) Uræmia
(F) **Therapeutic**
Post operative

Treat **Radical excision Unless contraindicated**

Contraind (1) Local Adhesions to (a) Bladder
(b) Pelvic wall
(2) Regional (a) Involvement of peritoneum
(b) Para aortic glands +
(3) Distant (a) Liver +
(b) Ascitis
(4) General (a) Bad health
(b) Old age
(c) Metabolic diseases
(d) General diseases
(5) Acute *complications* Acute intest obstruct

Methods of decision
(a) Digital examination
(b) Procto sigmoidoscopy
(c) Biopsy
(d) Exploratory laparotomy

Operation for recto anal carcinoma

Removal in one piece of
(1) Pelvic colon with mesocolon
(2) Rectum with (a) Peri rectal tiss
(b) Ischio rectal tiss
(c) Levators ani
(3) Anal canal with peri anal skin

(I) *Operations for carcinoma rectum*

(1) Local excision

(2) Conservative resection

With preservation of sphincters

(3) **Lockhart Mummery:** St Mark Hospital

(*a*) Preliminary inguinal colostomy

↓ (*b*) **Perineal excision**

(4) **Perineo-abdominal excision:** Grey Turner

(5) **Abdomino perineal excision:**

(*a*) **One stage: Ernest Miles**

(*b*) Two stage Coffey

(6) Abdominal Hartmann

Ind (*a*) Early high growth

(*b*) Upper third of rectum

(*c*) Unfit for combined operation

(7) Abdomino anal 'Pull through' of Goetze

Ind Low, freely movable growth

Pre oper treat

(1) Intestinal preparation

(*a*) Mag sulph zii

Mag carb zi

Aqua chloroform ozi

(α) Three or four doses two hourly

↓ (β) One dose a day

(*b*) Colon wash out B D

(*c*) Mist bismuth cum opio T D S

(*d*) Dimol grs V B D

(*e*) Entero vioform

(2) Preliminary drainage

Ind (*a*) Acute or chronic obstruction

(*b*) Rectal or peri rectal sepsis

(A) Cæcostomy

Ind Acute intestinal obstruction

(B) Left inguinal colostomy

(3) General preparation

(A) Blood transfusion

(B) Intravenous glucose saline

(4) Prophylaxis

(*a*) Anti strepto }
+(*b*) Anti-coli } sera
+(*c*) Anti gas gangrene }

(5) Investigations

(A) Blood (*a*) Hæmoglobin %

(*b*) Blood count

(*c*) Blood group

(*d*) Blood sugar

(*e*) Blood urea

(B) Blood pressure Pressure ratio percentage
Below 25% fatal
Above 75% risky
Near 50% best

(C) Urine (a) 24 hour specimen
(b) Catheter specimen
(c) Chemical exam.
(d) Microscopic exam
(e) Urea concentration
(f) Kidney efficiency tests

(D) Heart and lungs

Anæsthesia Spinal

Technique

(A) Mile s radical abdomino perineal operation

(1) *Abdominal part*
(1) Position high Trendelenburg lithotomy
(2) Incision right paramedian subumbilical
(3) Exploration of
(a) Mesocolon (α) Base
(β) Intermediate
(γ) Colic border
(b) Liver
(c) Local bowel adhesions etc
(d) Recto vesical pouch

(2) *Pelvic part*

Stage one (a) Deliver the pelvic colon out
(b) Ligature the inf mesent art
Between (α) First and second sigmoid branches
or (β) At the level of aortic bifurcation

Stage two (a) Complete division of pelvic mesocolon
Below the ligature
(b) Incision of the peritoneum
On both sides of mesocolic base
(c) Stripping of post aspect of pelvic colon and rectum
From ant surface of sacrum
(d) Division of peritoneum along pelvic brim
Upto the base of bladder or vagina

Stage three Separation of anterior wall of the rectum
From vesicles and bladder
Upto prostate

Stage four Division of lateral ligaments of rectum

Stage five Division across of pelvic colon
3" above the carcinoma

Stage six (a) Re-establishment of peritoneal pelvic floor
At the level of pelvic brim
(b) Correction of the tendency to ileal kink
At ileo-cæcal junction

Stage seven (a) Left inguinal colostomy
1.5 internal to ant sup iliac spine
(b) Closure of the abdomen

(3) *Perineal part*:
- (a) Closure of the anus by purse string
- (b) Incision · (α) Transverse sacro-coccygeal
  - ↓ (β) Longitudinal inter natal
  - ↓ (γ) Circular circum anal
- (c) Removal of the coccyx
- (d) Exposure of presacral cavity
- (e) Division of ·
  - (α) Coccygeus origins
  - (β) Levator ani origins
- (f) Dissection of anal canal from perineum
- (g) Removal of the whole mass
- (h) Gauze pack

Save: (1) *Ureters*
(2) *Urethra*

(B) Lockhart Mummery's two stage perineal excision
- (1) Left rectus inguinal colostomy
- ↓ (2) Three weeks' interval
- ↓ (3) Perineal excision

Ind. (1) Anal growth
(2) Ampullary growth

Contraind: Recto-sigmoid growth

Anæsth Basal narcotic + spinal

Pre-oper. (a) Urethral catheter
(b) Anal purse string

Steps
- (1) Incision sacral base to circum anus
- (2) Disarticulation of coccyx
- (3) Division of levators ani near origins
- (4) Dissection of rectum off prostate or vagina
- (5) Exposure and division of
  - (a) Para rectal peritoneum
  - (b) Meso rectum
- (6) Division of the bowel
- (7) Invagination of sigmoid stump
- (8) Closure of peritoneum
- (9) Removal of excised parts

Operation	*Advantages*	*Disadvantages*
(1) Miles	(a) Preliminary exploration	(a) Shock
	(b) Less recurrence	(b) Extensive
	(c) High growths	
(2) Mummery	(a) Less shock	(a) Recurrence +
	(b) Low mortality	(b) Only low growths

Post treat (1) Treatment of shock
(2) Blood transfusion + intravenous therapy
(3) Nothing by mouth + oral hygiene
For 48 hours
(4) Dressings after 72 hours
(a) Hydrogen peroxide } BD
↓ (b) Mercury perchlor
↓ (c) Normal saline
(d) Dettol
(5) Colostomy (a) Enema 5th day
(b) Purgative 6th day
(c) Irrigations daily from 7th day
(d) Passage of finger daily
(e) Laxatives every night
(6) Convalescence upto 18th day

Post compl (1) **Shock**
(2) **Acute gastric dilatation**
(3) **Gangrenous pelvic cellulitis**
(4) Hæmorrhage
(5) **Pulmonary complications**
(6) **Renal failure**
(7) Intestinal toxemia
(8) **Decubitus**
(9) Bladder dysfunction
Cause Trauma to (a) Sympathetic ganglion
+ (b) Presacral nerve
Clinic (a) Retention
(b) Atony
Treat Indwelling catheter
Ind Residual urine > 50 c cs
(10) Levator hernia

(II) *Operations for anal carcinoma*
(A) (a) Colostomy
↓ (b) **Local excision**
+ (c) Bilateral excision of inguinal glands
(B) (a) **Radium therapy** For primary
+ (b) Bilateral excision of inguinal glands

Recurrence rate after radical operation for rectal carc
Depends on
(1) Variety (A) Papilliferous nil
(B) Adenoid 14%
(C) Colloid 87 5%
(D) Melanotic 100%
(2) Stage later operation higher recurrence
(3) Operation (A) Miles 30%
(B) Mummery 46%

(III) *Treatment of inoperable ano rectal carcinoma:*

· **Palliative left inguinal colostomy:**

Ind (*a*) Intestinal obstruction
(*b*) Hæmorrhage
(*c*) Diarrhœa
(*d*) Pain
(*e*) Fistulæ pelvi rectal
ischio rectal
internal

(A) Recto sigmoid carcinoma

Clinic Intestinal obstruction syndrome

Treat Colostomy as a preventive as early as possible

(B) Ampullary carcinoma

Clinic Pelvi rectal suppuration

Treat Early colostomy as preventive and preliminary

(C) Anal carcinoma

Clinic Painful

Treat Early colostomy as preventive measure

(IV) *Palliative treatment for ano rectal carcinoma sequelæ*

(1) **Intestinal obstruction.**
(*a*) Enemata and wash outs
(*b*) Urgent life saving cæcostomy
(*c*) Preventive left inguinal colostomy

(2) **Rectal mucoid discharge:**
(*a*) Rectal injections of alum 10 grs. to ℥i
(*b*) Linear proctotomy with absorbent dressings

(3) **Hæmorrhage.**
(*a*) Local applications:
Adrenaline, Tr ferri perchlor
+ (*b*) General coagulant treatment
↓ (*c*) Scraping

(4) **Sacralgia:**
Morphia 1/6 gr every 8 hours
↓ 3 grs. every 4 hours

(5) **Pelvi rectal and ischio rectal suppuration:**
(*a*) Left inguinal colostomy
(*b*) Evacuation → external drainage

(6) **Recto vesical or vaginal fistulæ:**
(*a*) Immediate left inguinal colostomy
(*b*) Bladder and rectal irrigations

(7) **Ascitis:**
Repeated tappings or leave alone

(XII) RECTAL INCONTINENCE:

Causes (A) *Sphincter affections*

(1) **Congenital absence:**
Imperforate anus

(2) **Trauma:**
Post operative

(3) **Stretching:**
(*a*) Prolapse or intussusception
(*b*) Digital in anal fissure

(4) **Carcinomatous infiltration**

(5) **Paralysis:**
(*a*) Central
(*b*) Spinal

(B) *Sensory loss*
Whitehead s removal of ring of anal mucosa

(C) *Fæcal accumulation in rectum*

Treat (1) **Left inguinal colostomy** ·
Ind (*a*) Absent sphincter
(*b*) Paralysed sphincter
(*c*) Infiltrated sphincter
(*d*) Sensory incontinence

(2) **Sphinctero plasty** ·
Ind (*a*) Trauma to sphincter
(*b*) Stretched sphincter

(XIII) PRURITUS ANI:

Def Incessant itching of the anal and peri anal skin

Etio (A) **Constitutional:** Diabetes, rheumatism, gout

(B) **Local** (*a*) Thread worms
(*b*) Hæmorrhoids
(*c*) Mucoid discharge
(*d*) Constipation
(*e*) Eczema

(C) **Nervous**

Path (*a*) Erythema and erosions
↓ (*b*) Hypertrophy and lichenification
↓ (*c*) Lichenification erosions dermatitis
↓ (*d*) Extensive skin involvement

Treat (1) **Treat the etiology** ·
(*a*) Local
(*b*) Constitutional

(2) **Local treatment:**
(A) *Conservative*
(*a*) **Cleansing** and dry applications

(b) **Applications:**

(1) Percainal 1%

(2) Pulv zinci oxidi ℥ii
Lint camphor ℥iii
Anæsthesine ℥ii
Lanoline ozi
Vaseline oziss

(3) Liq plumbi subacetatis ℥i
Fresh milk ℥vii

(4) Paint (1) Saturated silver nitrate
↓ (2) Sod chloride ℥i to oi

(5) Deck s ointment

Salicylic acid	4 parts
Bismuth subnitras	10 parts
Mercury salicylate	4 parts
Oleum eucalypti	4 parts
Vaseline, Lanoline	āā to 100 parts

(6) Whitfield s ointments

(α) Acid carbolic grs v
Salicylic acid grs xx
Acid benzoic grs xx
Vaseline ozi

(β) Ung Picis
Zinc oxide grs xi
Ung acid salicylas ℥ iv
Lanoline ad oz i

(B) *Non operative*

(1) **Injections of sclerosing anæsthetics:**

Sol (a) Nupercaine 5 c cs
(b) Proctocaine
(c) A B A Solution

Compl (1) Abscess
(2) Sloughing
(3) Incontinence

(2) **X-Ray exposures**

(C) *Operative*

(1) **Ball's operation:**
Undercutting peri anal skin

(2) **Excision of peri anal skin.**
Ind (a) Peri anal eczema
(b) Failure of all other methods

(XIV) IMPORTANT POINTS

(1) Embryology of rectum and anal canal
(1) Hind gut upto peritoneal reflection
(2) Post allantoic gut upto anal sinuses
(3) Proctodæum—anal canal below the sinuses

(71) *Sites of carcinoma rectum*
- (a) *Recto sigmoid*
- (b) *Ampulla*
- (c) *Anal canal*
- (d) *Anus*

(72) *Clinical classification of carcinoma rectum*
- (a) *Obstructive* constipation alternating with diarrhœa
- (b) *Inflammatory* Tenesmus + blood + mucus
- (c) *Formative* (α) Cauliflower growth
  - (β) Blood + mucus
  - (γ) Incontinence
- (d) *Hæmorrhoidal* Internal hæmorrhoids in old
- (e) *Infiltrative* (α) Neuralgias
  - (β) Internal fistulæ
- (f) *Distant* (α) Enlarged liver
  - (β) Œdematous lower limbs
  - (γ) Ascitis
- (g) *Latent* Cachexia

(73) Younger the patient, more hopeless is the prognosis in carcinoma rectum

(74) *Clinical syndrome in carcinoma rectum*
- (a) *High growths obstruction*
- (b) *Low growths proctitis*
- (c) *Anal growths tumour*

(75) A [illegible]
[illegible]
c [illegible]
to exclude carcinoma rectum

(76) Anal canal carcinomata are usually mistaken for hæmorrhoids

(77) '*Dysentery or Hæmorrhoids in elderly people should in each case suggest carcinoma rectum*

(78) Clinical stages of carcinoma rectum
- (a) Pre ulcerative latent
- ↓ (b) Ulcerative diarrhœa with blood and mucus
- ↓ (c) Obstructive constipation + diarrhœa → obstruction
- ↓ (d) Perirectal (α) Perirectal suppuration
  - ↓ (β) Fistulæ in ano.
- ↓ (e) Infiltrative (α) Neuralgias
  - (β) Internal fistulæ
- ↓ (f) General carcinomatosis

(79) Intramural spread of carcinoma rectum is trivial

(80) Upward extramural lymphatic spread is most important in carcinoma rectum involving pelvic mesocolon and mesocolic, *iliac & aortic lymph glands.*

(81) Carcinoma of recto sigmoid or rectum is more malignant than carcinoma of colon.

(82) Chief difficulties in the early diagnosis of rectal carcinoma
(a) Insensibility of rectal mucosa
(b) Neglect of rectal examination
(c) Lack of symptoms in early stages.

(83) In young subjects carcinoma of the rectum progresses with extreme rapidity and in patients under 30 the only hope lies in early detection

(84) *Prominent clinical aids in the diagnosis of rectal cancer*
(a) *Rectal bleeding*
(b) *Signs of proctitis*
(c) *Digital examination*

(85) Main lymphatic spread in any rectal growth is in an un interrupted upward direction

(86) First lymph glands to be affected are peri rectal near about the growth, next are at or near the point of ligature of sup hæm vessels in which case the prognosis is bad

(87) Indications for radium in rectal cancer
(a) Refusal of operation
(b) Inoperable cases
(c) Recurrences

(88) Operations for carcinoma rectum
(A) Conservative Lockhart Mummery
(a) Preliminary colostomy
↓ (b) Perineal excision
Ind (1) Growth (α) Small
(β) Touchable
(γ) Freely movable
(2) General condition not too good
(B) Combined abdomino perineal
(1) One stage Miles
(2) Two stage Coffey
Ind (1) Growth (α) Big
(β) Untouchable
(γ) Peri rectal infiltration
(2) General condition good
(C) Palliative left inguinal colostomy
Ind Inoperable growth

(89) The first stage in all operations for carcinoma rectum must be
(a) Exploratory laparotomy
\+ (b) Preliminary drainage
(α) Deliberate left inguinal colostomy
(β) Urgent cæcostomy

(90) Complete removal of mesocolon with a strip of peritoneum on either side is essential to prevent recurrence in carci noma rectum.

(91) *Take care of the following in excision of the rectum*
(a) *Ureters*
(b) *Urethra*
(c) *Point of ligature of sup hæm art*

(92) In all operations for excision of the rectum, tie in a catheter in the bladder before operation is started

(93) Anal purse string is a very good preliminary step in excision of the rectum

(94) The prognosis of operation for radical removal of rectal carcinoma is in direct proportion to the stage of the disease at the time of the operation

(95) *Temporary urgent cæcostomy is a life saving procedure in most cases of colon resections and all cases of acute intestinal obstructions*

(96) *Intravenous saline should be given until*
Urine + Ag No_3 = Heavy white precipitate

(97) Whether the primary squamous celled anal carcinoma is treated by radium or surgery, the glands in the groin should be removed by operation.

(98) Mile s radical abdomino perineal operation

(A) Abdominal part
Rapid survey

(B) Pelvic part
(a) Ligature of inf mesent art
(b) Division of mesocolon + peritoneal incisions
(c) Separation of pelvic colon and rectum
(α) Posterior
(β) Lateral
(γ) Anterior
(d) Division of pelvic colon
(e) Re-establishment of pelvic floor
(f) Left inguinal colostomy
(g) Closure abdomen

(C) Perineal part
(a) Anal purse-string
(b) Incision —o
(c) Removal of coccyx
(d) Exposure of presacral cavity
(e) Division of coccygeus and levator origins
(f) Isolation of rectum and anal canal
(g) Removal of the whole excised mass
(h) Gauze pack

(99) Important points in excision of carcinoma rectum
(a) Ligature between first and second sigmoid branches
(b) Save (α) Ureters
(β) Urethra

(c) Purse string the anus
(d) Remove whole of the mesocolon and enough peritoneum

(100) *Do not forget to palpate liver before starting excision of the carcinoma rectum*

(101) When a case of carcinoma rectum in whatever position it may occur, is considered to be inoperable, the sooner the colostomy is performed, better it is for the patient

(102) *Chief signs and symptoms of rectal lesions*
(a) *Imperforate anus*
Acute intestinal obstruction within 3 days of birth
(b) *Perirectal suppuration*
Perirectal tender induration
(c) *Fistula in ano*
Perirectal external openings
(d) *Rectal prolapse*
Cylindrical red mass with central lumen
(e) *Fissure in ano*
Pain + spasm
(f) *Internal hæmorrhoids*
Painless, variable, bright red bleeding
(g) *Carcinoma rectum*
(1) *Obstructive intestinal obstruction*
(2) *Proctitis pseudo-dysentery*
(3) *Internal piles piles in seniles*
(4) *Tumour anal fungation*
(5) *Referred sciatica*
(6) *Distant enlarged liver*
(7) *Latent anæmia, debility*

(103) *Common post operative sequelæ in ano rectal operations*
(a) *Stricture*
(b) *Fissure*
(c) *Incontinence*
(d) *Prolapse*

(104) Stricture rectum most common causes
(a) Syphilis
(b) Carcinoma
(c) Post-operative

(105) *Hot hip-bath is very useful in rectal and perirectal inflammations*

(106) *Chief complication of fistula in ano excision is recurrence, the chief causes of which are*
(a) *Incomplete operation*
(b) *Tuberculosis.*

(107) *Chief question in internal hæmorrhoids from diagnosis and treatment points of view is*
Are they primary or secondary?

(108) If anæmia from bleeding piles is severe
(a) Inject the piles
or (b) Blood transfusion
↓ Operation

(109) If in injection treatment for acutely bleeding pile it is not possible to find out which pile is at fault ask the patient the direction of the blood squirt if any The offending pile is to the opposite side of the direction of the squirt (If the squirt is from right to left, the pile is on the right, and *vice versa*)

CHAPTER VIII

HERNIA

Def Entrance of the contents of a cavity, into its prolongation formed by

(a) **Non-obliteration** of a congenital process of its wall congenital hernia

or (b) **Insinuation** of its wall through a weak site in the parietes (α) Congenital inguinal canal
(β) Acquired ventral hernia

Ætio (1) Age (a) Infants
(b) Adolescents
(c) Seniles

(2) Sex (a) Males inguinal
(b) Females femoral
(even in females inguinal hernia is more common than femoral)

(3) Occupation laborious

(4) Predisposers

(A) **Weak spot** in abdominal parietes
(a) **Congenital** · Maldeveloped muscle
(b) **Acquired** · (α) Scars
(β) Stretching
(γ) Paralysis

(B) **Increased intra abdominal pressure** ·
(a) **Intermittent.**
(1) Laborious occupations
(2) Chronic cough
(3) Constipation
(4) Dysuria
(5) Pregnancy etc
(b) **Sudden:**
Severe muscular effort
Strangulation at first appearance

(C) **Hernial sac:**
(a) **Congenital:** Preformed
(b) **Acquired:**
(α) Distension diverticula
(β) Traction diverticula
(γ) Sliding hernia

Path anat (1) **Sac:** Peritoneal diverticulum
(a) Neck Communication between sac and peritoneal cavity

(b) Body
(c) Fundus

(2) **Coverings:** Layers of abdominal parietes
- (a) Extra peritoneal tissues
- (b) Fascia transversalis
- (c) Abdominal muscle layers
- (d) Subcutaneous tissues
- (e) Skin

(3) **Contents:** Any abdominal viscus except liver

Clinics: (A) **Hernia:**
: **Globular swelling at a hernial orifice:**
With: (a) [illegible]
(b) [illegible] own
(β) Manipulative

(B) **Contents:**
(1) Omentum
- (a) Doughy feel
- (b) Lobulated and spongy
- (c) Dull note
- (d) Reduction *en masse*

(2) Bowels:
- (a) Elastic feel
- (b) **Visible peristalsis**
- (c) **Resonant note**
- (d) Gradual reduction
- (e) **Gurgling**

(3) Colon:
- (a) Big size
- (b) Incarceration
- (c) Viscero ptosis

(4) Bladder:
- (a) Urinary trouble
- (b) **Change in size on catheterisation**

Varieties: (a) Para peritoneal.
: In direct inguinal
(β) Intra-peritoneal
(γ) Extra peritoneal latent
. Lipoma adherent to medial aspect of the neck of the sac

(5) Appendix:
- (a) Hernia with appendix attack
- (b) Tender McBurney
- (c) Palpation

(6) Meckel's diverticulum: Littre's hernia

(7) Ovary:
- (a) Abnormal menstruation
- (b) Ovarian sensation on pressure
- (c) P. V.

(8) Testis abnormal or normal descent
(a) Absence in scrotum or masking by hernial contents
(b) Testicular sensation on pressure

(9) Fluid signs of fluid
Causes (α) Hydrocele of hernial sac
(β) Communicating ascitis

(10) Loose bodies

Diff diag (See under respective Hernias)

Treatment

(1) **Truss treatment of hernia**·

Ind (a) Infants or seniles
(b) Refused or contraindicated operation

(A) *Truss should be ordered*
(1) As a possible method of cure in
(a) Inguinal, (b) Umbilical } hernias of infants within first year
(2) As a prevention of progression and strangulation
(a) Inguinal hernia
(α) Upto 4 years of age
(β) Adults where operation is postponed
(b) Umbilical hernia
Upto 2 years of age
(3) As a safeguard after emergency operation
After strangulated herniotomy
(4) As only a safeguard
Reducible hernia + contraindicated operation

(B) *Truss should be permitted in*
(1) Direct inguinal hernia
(2) Incisional hernia
(3) Oblique inguinal hernia
With operation contraindicated

(C) *Truss should be discouraged in*
Operable oblique inguinal hernia

(D) *Truss is dangerous in*
(1) Femoral hernia
(2) Adult umbilical hernia
(3) Incisional hernia
With small neck and large sac

Regional indications of truss

(1) **Oblique inguinal: contraindicated**
(2) **Direct inguinal: indicated**
(3) **Femoral: contraindicated**
(4) **Umbilical:**
(a) **Infantile: indicated**
(b) **Adult: contraindicated**

Tech: (1) Recumbent position
↓ (2) Reduction of hernia
↓ (3) Application of the truss:
(A) *Should control the hernia when:*
: Patient stands with legs apart, stoops and coughs
(B) Should be worn day and night:
For at least 18 months

Particulars: *Required for preparation of truss*
(1) Site
(2) Side
(3) Size · of the neck and sac
(4) Girth of the body at the level of hernia

Prognosis: Complete cure is possible only in:
(a) Inguinal }
(b) Umbilical } · hernias of infants

(2) Injection treatment of hernia
Ind. *Indirect, reducible inguinal hernia*
Contraind. (a) Large, old-standing hernia
(b) Irreducible hernia
(c) Truss uncontrollable hernia

Fluids · (1) Mayer: Zinc sulphate zi
Phenol crystals zvi
Glycerine ziv
Aqua cinnamomi ozi
Sterile distilled water ozii
(2) *Gal tanol*

Tech: (a) Semi Trendelenburg position
(b) Needle insertion at int. ring
(c) Injection ½" outside the ring
(d) Site. into the cord substance
. in the neighbourhood of int. ring
. through ext. obl. aponeurosis
(e) Number 6 to 12
(f) Interval: 5 days

Post. treat. Truss day and night for 3-6 months
Post. compl · (a) Shock
(b) Reaction
(c) Peritonitis

(3) Operative treatment of hernia:

Ind: Presence of a hernia:
(1) Age. between 18 months and 65 years
(2) Occupation. active, laborious
(3) Sex: females of child-bearing age
(4) Circumstances: going out of surgical help
(5) Local condition:
(a) **Progressive hernia**
(b) **Complicated hernia**

Contraind: (1) Age: very young and very old
(2) **Non-removable etiology:**
(a) Cough
(b) Constipation
(c) Dysuria
(3) Local: too big size
(4) General: dangerous constitutional disease

Operations: (A) **Herniotomy:** Removal of hernial sac
Ind: (a) Children
(b) Small, recent, congenital hernia

(B) **Herniorrhaphy:**
Tech: (a) Removal of hernial sac
+ (b) Repair of the region by sutures
Ind: (1) Average hernia
(2) Adult age

(C) **Hernioplasty:**
Tech: (a) Removal of hernial sac
+ (b) Living fascial graft repair
Ind: (1) Large hernia
(2) Recurrent hernia
(3) Weak peri-hernial structures
(4) Ventral hernia
(5) Direct acquired hernia
(6) Laborious occupation
(7) **Surety of asepsis**

Post operative complications.

(A) **Local:**
(1) **Hæmatoma:**
Varieties: (a) Local
(b) Regional
(c) Gravitational scrotum
Treat (a) Prophylaxis of hæmorrhage
(b) Aspiration or evacuation
(2) **Sepsis**
(3) Cut out sutures

(B) **Abdominal:**
(1) Paralytic ileus
In umbilical and ventral hernias
(2) Intestinal obstruction
(3) Peritonitis
(4) Fæcal fistula

(C) **Respiratory:** In umbilical hernia
(1) Collapse of the lung
(2) Œdema of the lungs
(3) Infarction of the lungs
(4) Pneumonia

(D) **Urinary:**
(1) Urinary infection
(2) Trauma to the bladder

Post operative treatment :

(1) **Convalescence:**
(*a*) Three weeks: in bed
(*b*) Six weeks: protected life
(*c*) Three months: supportive bandage
(*d*) Six months: no laborious occupation

(2) Treatment of etiology·
. Any cause of chronic strain

Post operative sequela : **Recurrence, recurrent hernia:**

Causes: (1) **Pre-operative : Contraindicated operations**
(*a*) Badly chosen cases
(*b*) Etiology untreatable or untreated

(2) **Operative: Faulty technique**
(*a*) Faulty operative procedure
(*b*) Neck. (α) Too low ligature
(β) Overlooked diverticulum
(*c*) Stitches. (α) Two tight
(β) Premature absorption
(γ) Rupture
(*d*) Trauma. (α) Nerves
(β) Muscles

(3) **Post-operative: Faulty convalescence**
(*a*) **Sepsis**
(*b*) Too short convalescence
(*c*) Untreated etiology

Factors· (A) **Anatomical:**
(1) Poorly developed muscles
(2) Obesity
(3) Senile muscular degeneration

(B) **Technical errors:**
(1) Sac (*a*) Failure of removal
(*b*) Overlooked diverticulum
(*c*) Improper closure
(2) Suture: (*a*) Tension
(*b*) Too tight
(*c*) Too early absorption
(3) Cord bulky cord
(4) Trauma: to nerves or muscles

(C) **Errors of judgement:**
(1) Improper patient
(2) Improper type of operation
(3) Improper convalescence

(D) **Other factors:**
(1) Hæmatoma → suppuration
(2) Injury to motor nerves
(3) Straining
(4) Nature of hernia:
(a) Direct
(b) Sliding
(c) Strangulated

Treat: Re-operation → Fascial graft hernioplasty

Tech. Expose the structures where they are normal

Difficulties: (a) Adhesions
(b) Obliteration of normal tissue planes

Complications of hernia:

(A) **Irreducible hernia:**

Def. A hernia, contents of which cannot be returned into the peritoneal cavity

Causes. (a) **Contents:**
(α) Adhesions between:
(1) Contents themselves
(2) Contents and sac
(β) Increase in the bulk of the contents
(b) **Neck:**
(α) Pressure around the neck
(β) Too narrow neck
(Γ) Adhesions round about. truss
(c) **Abdominal cavity:**
(α) Increased intra abdominal pressure
(β) Lack of room

Treat. (1) **Operation**
(2) Truss and taxis contraindicated

(B) **Obstructed hernia:**

Def Irreducible hernia with obstruction to the onward flow of intestinal contents

Clinic: (a) Irreducible hernia
+ (b) Mild intestinal obstruction

Treat: Operation

(C) **Incarcerated hernia:**

Def: Obstructed hernia due to fæcal impaction

Clinic (1) Hernial swelling.
(a) Large
(b) Tender
(c) Irreducible
(d) Doughy: pitting on pressure
(2) Intestinal obstruction:
(a) Visible peristalsis
(b) Vomiting
(c) Distension

Treat (1) Conservative
(a) Repeated liquid paraffin
(b) Cautious bowel washes
(2) Operation

(D) Inflamed hernia

Def Inflammation of peri hernial tissues, sac and contents with accumulation of inflammatory products

Causes (1) Trauma
(2) Obstruction → venous congestion

Clinic (a) Irreducible hernia
(b) Local signs of inflammation

Compl (1) Adhesions and irreducibility
(2) Hydrocele of the hernial sac
(3) Strangulated hernia

Treat (A) Postural treatment
Ind (a) Early stages
(b) No hydrocele of hernial sac
(B) **Herniotomy with drainage of the wound**

(E) Strangulated hernia

Def Hernia with acute obstruction to
(a) Reducibility
(b) **Circulation** (α) Lymphatic
(β) Venous
(γ) Arterial
(c) Nerve supply
(d) **Lumen** If any
(α) Total
(β) Partial Richter s hernia
And ultimately resulting in gangrene of the contents

Causes (1) **Excessive exertion** Straining
(2) **Too tight neck**
(a) Sudden appearance of hernia
(b) Sudden increase in contents
(c) Inflamed peri neck tissues
(3) **Contents**
(a) Sudden descent
(b) Sudden increase in contents
(c) Volvulus of the contents

Path (1) *Contents*
(a) Small intestines
(b) Omentum
(c) Large intestines
(2) *Constrictor*
(A) Inguinal
(a) External abdominal ring
(b) Peri neck fibrosis

(B) Femoral
(a) Deep crural arch
(b) Gimbernat
(c) Hey's ligament
(C) Umbilical peri neck fibrosis

(3) *Morb anatomy*:
(A) Stage of **viable gut**:
(a) Congestion
(b) Pulsating mesenteric vessels
(B) Stage of **hæmorrhagic infarction**:
(a) Blood supply cut off
(b) Mesenteric vessels non pulsating
(C) Stage of **gangrene**: At
(a) Site of constriction
(b) Apex
(D) Stage of **complications**:
(a) Constriction ring → **stricture**
(b) Transmigration
(α) Inflamed hernia
(β) **Peritonitis**
(c) **Perforation**:
(α) Proximal to constriction ring
↓ **General peritonitis**
(β) Distal to constriction ring
↓ **Hernial sac abscess**
↓ **Fæcal fistula**

(4) *Causes of death*
(1) **Shock**:
(a) Nervous mesenteric
(b) Circulatory
(2) **Toxæmia**: Proteoses + amino acids
(3) **Perforation** → Peritonitis
(4) **Paralytic ileus**

Clinic (1) Lump at a hernial site
(a) Tense
(b) Tender
(c) Dull
(d) Irreducible
(e) No impulse
+ (2) Acute intestinal obstruction
+ (3) Peritonism

Diff diag (1) Acute abdomen
(2) Torsion of testis
(3) Funiculitis
(4) Inflamed hydrocele, hæmatocele, pyocele
(5) Ruptured varicocele
(6) Acute inguinal lymphadenitis

(7) *Different grades of complicated hernia*
(a) Irreducible
(b) Inflamed
(c) Obstructed
(d) Strangulated

Abnormal varieties of strangulated hernia

(1) Richter s hernia
Def Strangulation of only a part of circumference of lumen
Site Femoral hernia
Clinic (a) Strangulation syndrome
+ (b) Incomplete obstruction syndrome
Compl Perforation -> (a) Peritonitis
(b) Fæcal fistula
Treat Early diagnosis -> early operation

(2) Maydl s retrograde strangulation
Def Strangulation on both the sides of constriction ring
Path Intestines (a) Entering into the sac
↓ (b) Leaving the sac
↓ (c) Loop in peritoneal cavity
↓ (d) Again entering the sac
↓ (e) Leaving the sac
Strangulation (A) Intra sacular distal
(1) From (a) to (b)
(2) From (d) to (e)
(B) Intra peritoneal proximal
(c)
Clinic (1) Strangulated hernia
(2) Peritonitis with free fluid
(3) *Peritonism marked*
Compl General peritonitis
Treat Operation
Diag Gut above the constriction more unhealthy than gut below

(3) Reduction en-masse
Def Reduction of the hernial sac with the unrelieved strangulated contents into the peritoneal cavity
Path (a) Reduction en masse
(b) Reduction en bissac
(c) Reduction of infected sac fluid
(d) Reduction of gangrenous intestines
(e) Rupture of the sac or contents
(f) Volvulus of the reduced loop
Clinic (1) *History of taxis*
(2) Sudden painful reduction
(3) Continuation of strangulation syndrome
or (4) Appearance of peritonitis syndrome
Compl (1) Peritonitis
(2) Paralytic ileus
Treat (1) Herniotomy -> drainage of sac fluid
↓ (2) Find out the condition
↓ (3) Exploratory laparotomy
↓ (4) Retrieve the sac from inguinal canal

↓ (5) Treat the strangulation
↓ (6) Peritoneal toilet
↓ (7) Drainage (a) Internal peritoneal
(b) External inguinal

(4) Strangulated sliding hernia

Treatment of strangulated hernia

(1) Taxis

Ind (a) Recent, hitherto-reducible hernia
+ (b) No inflammation
+ (c) Refusal for operation
or (d) No surgical help near by
or (e) Infants

Tech (1) Preliminary narcotic
(2) Trendelenburg position
(3) Regional relaxation
(4) Manipulations

Compl Reduction *en masse* (See above)

(2) Postural treatment

Ind (a) Recent, sudden and first irreducibility
(b) In the door of the operation theatre

Tech (1) Narcotic morphia
(2) Posture
(a) Trendelenburg in adults
(b) Judgement of Soloman in infants

Post. treat Herniotomy at the time of choice

(3) **Operative treatment.**

Pre operative (a) Morphia
(b) Skin preparation
(c) Catheterisation

If seen after 12 hours

(d) Gastric or duodenal drainage
(e) Anti shock measures
(f) 5% glucose saline
(g) Anti gas gangrene serum

Anæsth (1) Spinal
(2) Local novocain 1 or 2%
(a) First point medial to ant sup spine
(b) Peripheral nerves
(c) Skin and subcutaneous tissues
Diamond shaped
(d) Coverings and sac
(e) Mesentery and omentum

Steps (1) Incision
(A) Inguinal along and over the long of the tumour
(B) Femoral Lotheisen's inguinal incisi
(C) Umbilical. Below the neck.

(2) Exposure of the sac

(3) Isolation and gauze protection of the wound

↓ (4) Incision and evacuation of the sac

↓ (5) Division of constriction

- (a) Inguinal up and in
- (b) Femoral inwards
- (c) Umbilical lateral

(6) Withdrawal and examination of contents

- (A) Safe
  - (a) Fluid clear and odourless
  - (b) Gloss present
  - (c) Return of colour
  - (d) Peristalsis present
  - (e) Elastic feel
  - (f) Mesenteric pulsations present
  - (g) Bleeding appendices epiploica
- (B) **Dangerous** Opposite of (A)
- (C) **Doubtful** Midway between (A) & (B)

(7) Treatment of contents

- (A) Omentum excise after transfixion
- (B) Bowels
  - (1) If safe
    Return into peirtoneal cavity
  - (2) If doubtful
    Treat with warm saline and wait
  - (3) If gangrenous
    - (a) Small area
      - (α) Purse string
      - (β) Infold & free omental graft
    - (b) Constriction ring
      Invaginate
    - (c) Extensive area
      - (1) Small intestines
        - (α) Good general condition
          Resect & anastomose
        - (β) Moderate condition
          Resect + drain ends
        - (γ) Bad general condition
          Proximal short circuit
          ↓ Exteriorisation of loop
        - (δ) Hopeless condition
          Proximal enterostomy
          ↓ Exteriorisation of loop

(2) Large intestines
(α) Colostomy with
(1) Resection
or (2) Exclusion
↓ (β) Secondary anastomosis
(8) Excision of the sac with ligature of the neck
(9) Radical operation
. if (a) General condition good
(b) Sepsis not present
(10) Drainage of the wound

Techniques

(1) Immediate resection and anastomosis

Advant (a) Absence of starvation cachexia
(b) Absence of abdominal wall infection
(c) Absence of fæcal fistula

Ind (1) Early stage
(2) Good general condition
(3) Young age
(4) High site
(5) Length not too much
(6) Experienced surgeon

Tech (A) Removal of
(1) Gangrenous portion
+ (2) Damaged proximal intestines 1–2 feet
To avoid post operative peritonitis due to
(a) Leakage from anastomosis
(b) Perforation
(c) Paralytic ileus
(d) Distension necrosis

↓ (B) Anastomosis
(a) Varieties (α) End to-end
(β) Lateral
(γ) End to side
(b) Opening not less than two inches
(c) Site in situ

+ (C) Proximal enterostomy
Tech One foot above the anastomosis
Through a stab wound
Ind (a) Gross distension
(b) Peristalsis absent
Contraind (a) No undue distension
(b) Peristalsis present

(2) Exteriorisation of the intestines

Def Leaving gangrenous segment out of the wound with proximal enterostomy

Ind (1) Bad general condition
(2) Extensive gangrene

(2) **Paralytic ileus**
(3) **Peritonitis:**
: Entrance of sac fluid in abdomen
(4) Fæcal fistula
(5) **Enteritis**

(B) **Urinary:**
(1) **Acute retention**
(2) Urinary sepsis

(C) **Chest:**
(1) **Pneumonia**
(2) Collapse lung
(3) Œdema lung
(4) Infarction lung

(D) **Local:**
(1) **Sepsis of the wound**
(2) Cellulitis of abdominal wall.
In umbilical hernia

Post operative sequelæ
(1) Recurrence
(2) Intestinal stenosis
(*a*) Constriction ring
(*b*) Anastomosis site

Anatomical varieties of hernia

(1) INGUINAL HERNIA

Varieties (A) **Oblique inguinal hernia** ·

Def Hernia which enters the inguinal canal through the internal abdominal ring

Etio (1) Congenital
(*a*) **Patent funicular process**
(*b*) Weak inguinal muscles
(α) Malgaigne s bulges
(β) Weak cremaster
(2) Acquired
(*a*) Ilio inguinal paralysis
(*b*) Prolapse of the cord due to
(α) **Poor musculature**
+(β) **Repeated straining**

Pathology (1) **Congenital** No obliteration at int ring
(*a*) **Of vaginal process:**
Enters tunica vaginalis
(*b*) **Of funicular process:**
. Upto the top of the testis
(2) **Infantile:** Obliteration at internal ring
(*a*) **Retro-funicular**
(*b*) **Intra-funicular:**
Two layers of peritoneum

Coverings (a) Skin and subcutaneous tissues
(b) External spermatic fascia
(c) **Cremasteric fascia**
(d) **Internal spermatic fascia**
(e) Extra peritoneal tissues

Associations (1) Malgaigne's bulges
(2) **Imperfect descent of testis**
(3) Femoral hernia
(4) **Hernia on the other side :** 30%

Clinic (a) **Sudden** complete descent
or (b) **Gradual** progressive descent
(1) **Bubonocele :**
Hernia upto external ring
or (2) **Scrotal**
Hernia entering the scrotum
(a) **Reducible**
or (b) **Irreducible**

(B) Direct inguinal hernia :

Def Hernia through the post wall of inguinal canal (Hesselbach's triangle)

Anat (1) Bounded by
(a) Inferior epigastric art
Lateral
(b) Lower border of conjoined tendon
Above
(c) Ilio pectineal insertion of conjoined
Below
(d) Lateral border of the rectus
Medial

(2) Covered by
(a) Skin and subcutaneous tissues
(b) External spermatic fascia
(c) **Conjoined tendon aponeurosis**
(d) **Transversalis fascia**
(e) Extra peritoneal tissues

Etio (1) **Acquired :**
Due to chronic intermittent strain
(2) Congenital
(a) Circular deficiency in post. wall
\+ (b) Tubular peritoneal process

Clinic (1) Age elderly
(2) Bilateral more often
(3) Etiology . chronic strain
(4) Progress gradual
(5) Size small or moderate

(6) Site not scrotal
Being a bulging of all the layers of the abdominal wall it progresses centrifugally and progresses upwards and outwards due to resistance of the Poupart, the rectus and the pyramidalis. It seldom enters the scrotum

(7) Appearance and reduction without strain

Differential diagnosis between indirect and direct inguinal hernia

Clinic	*Indirect*	*Direct*
Age	Infancy to 30	After 30
Shape	Oval or pear	Globular
Side	Unilateral 75%	Bilateral 60%
Extent	Scrotal	Seldom scrotal
Reducibility	Often irreducible	Always reducible
Relation to cord	In front and outer	Above and inner
Direction	Oblique along canal	Straight out of ext ring
Inguinal canal	Posterior wall firm	Post. wall deficient
Progress	Sudden or rapid	Gradual and slow

Clinical test (1) Make the patient lie down
(2) Reduce the hernia
After relaxing the inguinal region
(3) Press 5″ above the midpoint of
(a) Anterior sup iliac spine
↓ (b) Symphysis pubis
(4) Let the patient stand and cough
(5) (a) Non descent oblique
(b) Descent direct

Operative evidence (1) Oblique
(a) Neck to the lateral side of inf epig art
(b) Sperm cord close and deep to the sac
(2) Direct
(a) Neck to the medial side of inf epig art
(b) Spermatic cord anterior

(C) Interstitial inguinal hernia

Etio Congenital

Morb anat (A) Patent processus vaginalis
+ (a) Pro peritoneal diverticulum
(b) Intermuscular diverticulum
(c) Pre muscular diverticulum
(d) Retro peritoneal diverticulum

(B) Absent processus vaginalis:
+ (a) Pre-muscular sac
(b) Retro-peritoneal sac

Associations: (1) Mal-descended testis
(2) Absent cremaster
(3) Superimposed rings

Clinic: Bulging external to and above the external ring

Compl: (1) Reductio-en-bissac
(2) Recurrence

(D) **Sliding inguinal hernia:**

Etio: (a) Elderly patients
(b) Visceroptosis

Path: Visceroptotic sliding of posterior peritoneum with retro peritoneal cellular tissues and colon down along the inguinal canal into the scrotum.

Morb anat. (1) Peritoneum is absent on the posterior aspect of the sac
(2) Posterior wall of the sac is made up by:
(a) Retro peritoneal cellular tissues
(b) Extra peritoneal aspect of colon

Sequence: (a) Posterior wall
↓ (b) Fundus
↓ (c) Anterior wall
} : sliding peritoneum

Clinic: (a) Senile patients
(b) **Large size**

Compl: (1) Irreducibility
(2) Incarceration
(3) Operative trauma to.
(a) Cæcum or colon
(b) Colon vessels
(4) Post operative retro-peritonitis

Differential diagnosis of inguinal hernia:

(1) **Femoral hernia:**
(a) Below and lateral to the pubic spine
(b) No impulse through external ring

(2) **Mal-descended testis:**
(a) Absence from scrotum
(b) Testicular feel on pressure

(3) **Encysted hydrocele of cord or canal of Nuck:**
(a) Irreducibility
(b) Moves with the testis
(c) Trans-illumination

(4) **Inguinal or funicular growths:**
(a) Lipoma

(b) Fibroma
(c) Lymphangioma

(5) **Varicocele:**
(a) Worms in a bag feel
(b) Fills from below upwards

(6) **Large hydrocele:**
(a) Cord felt at the top
(b) No impulse
(c) Translucency

(7) **Inguinal lymphadenitis:**
(a) Lobulated feel
(b) Other discrete glands
(c) No impulse
(d) Septic inflammation

(8) **Inguinal cold abscess·**
Primary focus in hip, pubis or spine

Treatment of inguinal hernia

(1) Truss (See above)
Measure Girth midway between iliac crest and trochanter

(2) **Injection treatment:** (See above)

(3) **Operative treatment**

Anæ th (1) Spinal Stovaine
(2) Local Novocain 1% in normal saline
+ Adrenalin 1 in 1,000 1 m. to 10 c cs

Tech (A) Subcuticular wheals
(a) Ant. sup. spine
(b) Saphenous opening
(c) Suprapubic crease midline
(B) Subcutaneous infiltrations
(a) Joining the wheals
(b) Around the scrotum
(C) Deep infiltrations
(a) Nerves
(b) Inguinal canal
(c) Spermatic cord

Operations (A) **Herniotomy:** Upto 4 years of life

(1) **Russell.**
(a) Incisions
(α) 5 ′ above and parallel to Poupart
or (β) Along the flexion crease
(b) Division of ext oblique aponeurosis
Without opening ext ring
(c) Separation of cremaster fibres
(d) Exposure of the cord and sac
(e) Isolation of the sac

(α) From outside
or (β) From inside
(f) Reduction of contents
(g) Torsion and transfixion of the neck
(h) Excision of the sac
(i) Closure of the wound
(α) Cremaster ob catgut or silk
(β) Ext. oblique 1 catgut or silk
(γ) Subcutaneous layers

(2) **Mitchell Bank:**
(a) Separation of the tissues of the cord
(b) Isolation of the sac
(c) Traction on the sac
Till neck is on level with ext ring
(d) Ligature and division of the neck
At the ext ring
(e) Closure

(B) **Herniorrhaphy:**
Ind (a) After 4 years of age
(b) Weakness of muscles
(α) Primary
(β) Secondary

(1) **Halstead or Andrew:**
Syn (a) Non transplantation method
(b) Anterior imbrication method
Ind (1) Age between 4 and 12
(2) Non descent of testis
Contraind Direct hernia
Tech **Cord submuscular** ·
(a) Cord
↓ (b) Conjoined tendon to Poupart
↓ (c) Overlapped external oblique
Sequela Direct hernia

(2) **Bassini:** After 12 years of age
Tech **Cord intermuscular:**
(a) Conjoined tendon to Poupart
↓ (b) Cord
↓ (c) External oblique suture

(3) **Andrews** ·
Syn Posterior imbrication method
Ind Weak inguinal canal
Tech **Cord interaponeurotic:**
(a) Conjoined tendon to Poupart
↓ (b) Upper ext oblique to Poupart
↓ (c) Cord
↓ (d) Lower to upper ext. oblique

(4) **Modified Halstead :**

Ind (*a*) Direct hernia
(*b*) Longstanding large hernia
(*c*) Recurrent hernia
(*d*) Hernia with varicocele

Tech **Cord subcutaneous :**
· (*a*) Conjoined tendon to Poupart
↓ (*b*) External oblique suture
↓ (*c*) Cord

(C) Hernioplasty :

Ind (*a*) Large hernia with weak musculature
(*b*) Failure of posterior wall of inguinal canal
(*c*) Recurrent hernia

(1) **Ring construction :** Internal abdominal ring

Ind (*a*) Medium oblique inguinal hernia
\+ (*b*) Good musculature
\+ (*c*) Stretched rings

Steps (1) Herniotomy
(2) Internal ring reconstruction
(*a*) Simple lateral suture
Lateral to the cord
(*b*) Medial reconstruction
Medial to the cord
(α) Silk darning
(β) Fascial strip darning
(γ) Turner's pedicled fascia lata
Ind (1) Men over 45
(2) Longstanding hernia
(3) Direct hernia
(4) Sliding hernia

(2) **Silk lattice repair :**

Tech Silk lattice without tension between
(*a*) Conjoined tendon
& (*b*) Poupart
Behind the cord

(3) **Gallie's living fascial graft :**

Tech (A) **Darning :** by
(*a*) Fascia lata strips
(*b*) Ext. oblique aponeurosis strips
(*c*) Peritoneal strips from excised sac
(B) **Many tailed fascial graft :**
Fascia lata

(C) **Pedicled muscle graft**
Tensor fasciæ femoris

Ind (a) Large hernia
(b) Direct hernia
(c) Sliding hernia
(d) Recurrent hernia
(e) Umbilical hernia
(f) Incisional hernia
(g) Muscular weakness
(h) Laborious occupations

(4) **Zimmerman** (Med Ann. 1939)

Ind Direct inguinal hernia
Object Repair of the canal floor
Steps (a) Dissection of transversalis off the sac
(b) Transversalis fascia to Poupart
Behind the cord
(c) Incision of lower ext oblique flap
At the internal ring
(d) Suture
of Medial part of lower ext. obl flap
to (β) Transversalis fascia
behind the cord
beneath the internal oblique

(8) **Bloodgood**

Ind Direct hernia
Tech Rectus sheath flap to Poupart

Special points and variations

(A) Schmieden s technique
Upward and lateral displacement of the emergence of the cord at the internal ring with Bassini technique

(B) Other methods of approach to inguinal canal
(a) Intra-peritoneal midline laparotomy
(b) Extra peritoneal midline incision
Cheatle Henry

(C) **Suture material in hernia**
(a) 20 days chromicised catgut
(b) Silk
(c) Living fascial graft or strip

(D) Congenital hernia of tunica vaginalis
(a) Child reconstruct the tunica
(b) Adult (α) Excision / (β) Eversion } of the tunica

(E) Lipoma of the cord
Remove

(F) Female inguinal hernia
(G) Inguinal hernia with ectopic testis
Points (1) Inguinal canal is rudimentary
Take care of ext. iliac vessels
(2) Excise the round ligament or testis
(3) Obliterate the inguinal canal
(H) Very large hernia
Pre oper (1) Trendelenburg with purging and fasting
For six weeks
(2) Local anæsthesia
Oper (a) Excision of the omentum
(b) Operation by stages
Post. oper Belt
(I) Sliding hernia
(a) Take care of the colon
(b) Take care of the vessels
(c) Take care of the extra perit cellular tissues
(d) Take care of post-operative period
(α) Paralytic ileus
(β) Chest complications

Operative mishaps

(1) Injury to
(a) Nerves (α) Ilio inguinal
(β) Ilio hypogastric
(b) Vessels (α) Femoral vein
(β) Inf epig vessels
(γ) Cæcal vessels
(c) Vas
(d) Bladder
(e) Intestines, cæcum colon
(2) Hernial sac
(a) Tearing of the peritoneum
(b) Overlooked diverticulum

After treatment
(1) Three weeks in bed
(2) Three months light work
(3) Three years be careful
(4) [illegible]
(
(
(
(
(e) Chronic dysuria
(f) Pregnancies
(g) Laborious work

Special post operative complications

(1) Hæmatoma:

Varieties (a) Local
(b) Scrotal
Etio (1) Big hernias
(2) Incomplete hæmostasis
Treat (a) Rubber dam strip 48 hours
(b) Stitch up scrotal bottom to ant abd wall 48 hours
Compl Sepsis → recurrent hernia

(2) **Retention of urine**

(3) **Abnormal testis**
(a) Torsion
(b) Atrophy

(4) **Venous back pressure**
(a) Vaginal hydrocele
(b) Varicocele

(5) **Sepsis**
(a) Local
(b) Funiculitis
(c) Epididymo orchitis

Special complications of sliding hernia
(1) Trauma to cæcal vessels
(2) Trauma to cæcum and colon
(3) Retro peritoneal cellulitis

(2) FEMORAL HERNIA

Anatomy (1) Neck
(a) *Boundaries* Poupart ↑ Femoral V ←0→ Gimbernat ↓ A Cooper
(b) *Level* Gimbernat
(2) Course
(a) Femoral sheath
↓ (b) Saphenous opening
↓ (c) Up and out
(3) Coverings
(a) Skin and subcutaneous tissues
(b) Cribriform fascia
(c) Crural sheath
(d) Septum femorale
(e) Extra peritoneal tissues

Etio Parous women between 20 and 45

Path (1) Russell s congenital theory
Peritoneal prolongation along femoral vessels

(2) Acquired theory ·
(a) Repeated strains
(b) Obesity with weakened fibrous planes
(c) Wide pelvis in females

Clinic (1) **Swelling:** Round, elastic, reducible or irreducible
(A) Position.
(a) Below the inner end of the Poupart
↓ (b) Upper part of the thigh
↓ (c) Below the outer part of the Poupart
(B) Neck
(a) Below the Poupart
(b) Lateral to pubic tubercle
(c) Medial to femoral vessels
(C) Walls palpable

Diff diag (A) *From reducible femoral hernia:*
(1) **Inguinal hernia:**
(a) Relation to Poupart and pubic tubercle
(b) No palpable walls
(2) **Saphenous varix:**
(a) Venous hum
(b) Cruveilhier's thrill
(c) Kelly's quiver
(d) Varicosity of the leg
(3) **Psoas abscess:**
(a) Primary focus
(b) Hourglass fluctuation

(B) *From irreducible femoral hernia*
(1) **Irreducible inguinal hernia:**
(See above)
(2) **Inguinal or femoral lymphadenitis:**
(a) Septic focus
(b) Nodular
(c) No stalk
(3) **Inguinal or femoral lipoma:**
(a) Lobulations
(b) No stalk
(4) **Femoral aneurysm:**
(a) Pulsations
(b) Pressure signs
(5) **Psoas bursa:**
(a) Flexion of the hip
(b) Psoas spasm

(C) *From strangulated femoral hernia*
(1) **Suppurating glands of Cloquet**
(2) **Obturator hernia:**

(a) More medial
(b) Obturator neuralgia

(3) **Rupture of adductor longus:**
Painful loss of adduction thigh

Important points

(a) **Early and frequent strangulation**
(b) **Frequent Richter's hernia**
(c) **Constricting agents:**
(α) **Gimbernat**
(β) **Neck**
(d) **Bladder implication**
(e) **Relations of femoral v. and obturator art.**
(f) **Common in females**

Treat (A) **Lotheisen's or Annandale's operation:**

(1) Inguinal incision
(2) Division of ext. oblique
(3) Division of transversalis fascia
(4) Isolation of the neck
(5) Transfer of the sac to the inguinal region
(6) Incision of the sac
(7) Reduction of contents
(8) Transfixion and ligature of the neck
(9) Excision of the sac
(10) Herniorrhaphy suture of
(a) Conjoined tendon to Cooper's ligament
or (b) Poupart to pectineal fascia
(11) Suture of ext oblique
(12) Closure

(B) **Standard operation:**

(1) Incision
(a) **Crease**
(b) Inguinal canal
(2) Exposure of
(a) Ext. oblique aponeurosis
(b) Poupart
(c) Scarpa's Δ
(3) Scarpal:
(a) Exposure of the sac
(b) Reduction of contents
(c) Division of the neck
(4) Inguinal:
(a) Exposure of the sac
(1) Incision of ext. oblique
(2) Incision of cremaster
(3) Displacement of cord

(4) Incision of transversalis fascia
(5) Exposure of the neck
(b) Ligature and division of the neck
(5) Closure of the opening
Conjoined to Cooper
(6) Repair of the wound
(C) Low operation
(1) Incision (a) Crease
(b) Below and parallel to Poupart
(c) Vertical over saphenous opening
(2) Isolation of the sac
(3) Reduction of the contents
(4) Ligature of the neck
(D) Henry s extra peritoneal approach
Through abdominal midline incision

Methods of closure of the defect

(A) Suture
(1) Standard
Conjoined to Cooper
(2) Lotheisen
Conjoined to Cooper and Poupart
(3) Marcy s purse-string
(a) Poupart
↓ (b) Gimbernat
↓ (c) Pectineal fascia
↓ (d) Crural sheath
↓ (e) Poupart
(4) Bassini
Poupart to pectineal fascia
(5) Lockwood
Poupart to Cooper
(B) Fascial strip
Poupart to Cooper
(C) Fascial flap
(a) Wyllys Andrews
Conjoined + ext oblique to Cooper
(b) Bloodgood
Rectus sheath to Cooper
(D) Crural canal plug
(1) Two ligatures method (See above)
(a) Neck ligatured and cut crural aspect
+ (b) Neck ligatured and cut Inguinal aspect
↓ (c) Leave in the intervening portion in femoral canal
(2) Inverted sac plug
(3) Auto transplants

(3) UMBILICAL HERNIA

Varieties (1) **Congenital umbilical hernia:**
. Non closure of umbilicus

(A) Exomphalos·

Def Protrusion of the intestines at the umbilicus in the base of the umbilical cord, with non closure of abdominal parietes

Varieties (a) **Ruptured:** No covering
(b) **Non ruptured:** Amniotic covering

Compl (1) Prolapse intestines
(2) Peritonitis
(3) Intestinal obstruction

(B) Minor:

Path Incomplete retraction of intestines into the abdomen

Clinic Congenital hernia of the loops of intestines into the umbilical cord

Compl (a) Injury to intestines
At the cord ligature
(b) Peritonitis

Treat (1) Conservative alcohol application
(a) Narcosis
(b) Cleansing
(c) Absolute alcohol compresses
(d) Bandage

(2) **Immediate plastic operation:**
(a) Excision of amniotic covering
(b) Reduction of prolapsed bowel
(c) Freshening of defect margins
(d) Closure of the defect

Difficulties (1) Refusal of intestines to go in
(2) Non apposition of defect margins

(2) Infantile umbilical hernia:

Etio (a) Delayed umbilical closure
or (b) **Increased intra abdominal pressure**
↓ Stretching of newly formed umbilical scar

Clinic (1) Age about 3 years
(2) Reducible protrusion at the umbilicus

Treat (A) **Conservative:**
(a) Firm binder
or (b) Rubber belt } **: for 18 months**
+ (c) Treat the etiology circumcision

(B) **Operation:**
(1) Subcut silkworm **purse-string:**
Ind (a) Small size
(b) Reducible
(2) Open operation

(3) Adult para-umbilical hernia:

Etio: Women of 40
· Obesity
: Repeated pregnancies

Cause: (*a*) Stretched umbilicus due to:
(α) Chronic strain
(β) Increased abdominal pressure
(*b*) *Recurrence of cured infantile hernia*

Morb anat: (1) Supra umbilical
(*2*) Infra umbilical

Clinic (1) **Blind hernia:**
Chronic dyspepsia
Worse on lying down
↓ (2) **Reducible** umbilical protrusion.
With impulse on straining
↓ (3) **Irreducible** umbilical swelling.
Gigantic, lobulated, no impulse

Compl (*a*) **Adhesions**
(*b*) **Loculations**
(*c*) **Irreducibility**
(*d*) Incarceration
(*e*) **Strangulation:** Mortality 30%
(*f*) Fæcal fistula
(*g*) Intertrigo

Treat **Operative:**

Pre oper (*a*) Reduction of fat
(*b*) Care of the heart and chest
(*c*) Intestinal antiseptics and laxatives
(*d*) Skin preparation

Anæsth (1) **Spinal**
(2) Regional novocain infiltration
(3) General contraindicated

Operation **Mayo:**
(1) Transverse elliptical incision
Well away from the hernial neck
(*2*) Isolation of the sac neck
(3) Opening of the sac neck
(4) Excision of
(*a*) Skin
(*b*) Fat
(*c*) Sac
(*d*) Adherent omentum
(5) Return of the intestines
(6) Repair of the abdominal wall.
(A) **Overlapping method:**
(*a*) Transverse overlapping of.

(α) Peritoneum
(β) Posterior rectus sheath
(b) Vertical union of rectus muscle
(c) Transverse overlapping of
Anterior rectus sheath
(B) **Gallie's fascial graft** ·
(a) Fascial strip darning
(b) Many tailed fascial graft
(7) Drainage for 48 hours

Post. compl (A) Operative
(a) Trauma to the bowel
(b) Trauma to the peritoneum
(B) Post operative
(1) **Respiratory:**
Pneumonia, collapse lungs
(2) **Abdominal:**
(a) **Acute gastric dilatation**
(b) **Paralytic ileus**
(3) **Circulatory:**
(a) Shock
(b) Heart failure
(C) Sequela recurrence

(4) VENTRAL HERNIA

Def. Protrusion of peritoneal cavity through a defect in the ant. abdominal parietes

Etio (a) **Weak spot:**
(α) Anatomical
(1) Small holes in linea alba
(2) Divarication of the recti
(β) Acquired
(1) Incisional
(a) Sepsis
(b) Burst abdomen
(2) Stretching.
(a) Repeated pregnancies
(b) Incomplete convalescence
After laparotomy
(3) Muscular paralysis nerve trauma
(4) Sepsis intra muscular abscess
+ (b) **Increased intra abdominal pressure**
or (c) **Traction:** Extra peritoneal lipoma

Path (1) **Potential hernia:**
· Peritoneal process drawn out as a result of traction by an adherent lipoma
↓ (2) **Latent hernia:**
· Empty peritoneal sac masked by fat

↓ (3) **Protuberant hernia:**
Big sac with omentum and intestines

Varieties (A) **Median ventral hernia:**

(1) **Median epigastric:**

Etio (*a*) Extra peritoneal lipoma
or (*b*) Holes in linea alba
or (*c*) Operative incision
+ (*d*) Strenuous occupation

Clinic (1) **Latent:**
Dyspepsia worse on recumbency
(2) **Protuberant:**
Post operative

Diff diag Gastric ulcer

Treat Exploration and hernioplasty

(2) **Median hypogastric:**

Etio (*1*) Women with repeated pregnancies
(2) Midline incision

Clinic Protuberant type

Contents Pregnant uterus

Treat (*a*) Sterilisation
(*b*) Suture of the recti
(*c*) Super imposition of fasciæ

(3) **Complete median:**

Etio Divarication of the recti

Clinic On raising the head in supine position
(1) Insinuation of ulnar border of the hand between the two recti
(2) Median linear protuberance between the recti

Treat (1) **Conservative:** Abdominal support
(2) Rectus suture with super imposition of sheath

(B) **Lateral ventral hernia**

(1) **Incisional ventral hernia:**

Etio (*a*) **Bad suturing:**
(α) Intervening gaps
(β) Too tight sutures
(γ) Burst abdomen
(*b*) ***Sepsis***
(*c*) **Prolonged drainage**
(*d*) **Stretching:**
(α) Incomplete convalescence
(β) Chronic or intermittent strain

Varieties (*a*) Defined neck
(*b*) Large multilocular

Compl. **Strangulation:**
(a) Contains small intestines
(b) Signs of obstruction masked
(c) Toleration of toxæmia
(d) Gangrene common & swift

Treat Operation **Hernioplasty**

(2) **Scar ventral hernia:**

Etio (a) Incisional (See above)
(b) Gangrene, ulceration or abscess Of abdominal wall

Path All layers are welded and thinned out

Clinic Visible peristalsis through thin wall

Compl (a) Adhesions
(b) Irreducibility
(c) Chronic intestinal obstruction
(d) Strangulation
(e) Ulceration
(f) Fæcal fistula

Treat (1) Conservative
(a) Belt and support
+ (b) Remove the etiology
(2) Operative
(A) Herniotomy
Open the peritoneum at a distance from the hernial sac
↓ (B) Hernioplasty
(a) **Overlapping of layers:**
Small hernia
(b) **Gallie darning:**
Large hernia
(c) **Many-tailed fascial graft:**
Very large hernia
(d) **Rectus transplantation:**
(1) Detachment of recti insertions from pubis
(2) Re suture to opposite sides of midline
(3) Rectus sheath suture

Post treat (a) Prolonged convalescence
(b) Prolonged abdominal belt

(3) **Interstitial ventral hernia:**

Etio (a) Rupture muscle
(b) Gumma muscle
(c) Abscess muscle
} abdominal wall

(4) **Paralytic ventral hernia:**

Etio (a) Operative nerve trauma

↓

(b)

Treatment of ventral hernias

(1) Conservative abdominal belt and straps
(2) Operative
 (A) Herniotomy
 ↓ (B) Hernioplasty
  (a) Overlapping
  (b) Fascial transplants

Post operative treatment of ventral hernias

(1) Prolonged convalescence
(2) Treatment of chronic and intermittent straining
(3) Prolonged abdominal support

Post operative complications of ventral hernias

(1) Hiccough
(2) Acute gastric dilatation
(3) Paralytic ileus
(4) Respiratory complications
(5) Burst abdomen
(6) Recurrence

(5) LUMBAR HERNIA

Etio (A) Congenital
 (a) Subcostal
 (b) Petit
(B) Acquired
 (a) Scar sepsis and stretching
 (b) Paralysis trauma to nerves

Clinic Reducible swelling after a lumbar operation

Diff Diag (a) Cold abscess
 (b) Lipoma
 (c) Phantom hernia

Treat (1) Conservative Abdominal belt
 (2) Operative Fascial hernioplasty

(6) OBTURATOR HERNIA

Anat Hernia through obturator foramen

Etio Parous women past 55

Clinic (a) Swelling in medial part of Scarpa triangle
 (b) P V *or* P R
 (c) Obturator neuralgia Howship Romberg

Compl Strangulation
 (a) Total
 (b) Partial Richter

Diag (1) Strangulation syndrome
 (2) Adduction spasm of the thigh
 (3) Obturator neuralgia pain in knee

Treat Combined operation
(A) Lower exposure → drainage of the sac
↓ (B) Laparotomy → (a) Reduction of contents
↓ (b) Treatment of strangulation
↓ (c) Excision of the sac
↓ (C) Hernioplasty
Closure of the neck by costal cartilage transplants

(7) GLUTEAL HERNIA
Varieties (A) Gluteal through greater sacro-sciatic notch
(a) Supra pyriformis
(b) Infra pyriformis
(B) Sciatic through lesser sacro-sciatic notch
Clinic (1) Acute strangulation syndrome
+ (2) Abscess syndrome in gluteal region
Diff diag (1) Aneurysm gluteal or sciatic
(2) Abscess Acute or chronic
(3) Lipoma subfascial
(4) Weaver s bottom bursa under gluteus max
(5) Sciatica
Treat Open exploration Of every acute gluteal swelling

(8) PERINEAL HERNIA
Etio Females
Anat (A) Ischio rectal fossa
(B) Lateral vaginal wall
Space of Schwalbe
(C) Labium
(D) Perineum
(E) Rectal prolapse rectum
Cause (a) Post-operative
(b) Prolapse uterus or rectum
Diff diag (1) Sub-peritoneal lipoma or fibroma
(2) Cold abscess
(3) Simple visceral prolapse
Treat (1) Exploration and repair
+ (2) Treatment of etiology

IMPORTANT POINTS

(1) Regional indications of truss
(A) Oblique inguinal hernia contraindicated
(B) Direct inguinal hernia indicated
(C) Femoral hernia contraindicated
(D) Umbilical hernia
(a) Infants indicated
(b) Adults contraindicated.

(2) Every hernia is bound to increase in size due to increased abdominal pressure caused by
(a) Coughing
(b) Vomiting

(*c*) Micturition
(*d*) Defæcation
(*e*) Parturition
(*f*) Muscular work

(3) Truss in adults predisposes to strangulation when hernia comes down

(4) *Chief cause of recurrence after a hernia operation is*
(*a*) *Low removal of neck*
or (*b*) *Failure to close the canal at its commencement*
or (*c*) *Damage to muscular sphincteric mechanism*

(5) The essential question in a hernia operation
Can normal mechanism of the canal be kept or must it be replaced by something different?

(6) *Groups of operations for inguinal hernia*

(A) *Congenital oblique inguinal hernia* — *Herniotomy*
(*a*) Removal of entire sac
\+ (*b*) Accurate reconstruction

(B) *Large oblique inguinal hernia* + *Good muscles* + Stretched rings } *Herniorrhaphy*
(*a*) Removal of entire sac
\+ (*b*) Plastic strengthening of *posterior wall*
\+ (*c*) Restoration of diameter of internal ring

(C) *Direct or large oblique* + *Atrophied muscles* + Failure of post wall of ing canal } *Hernioplasty*
(*a*) *Gallie's fascial darning or graft*
or (*b*) Bloodgood's rectus flap

(7) *Strangulated hernia is the most common cause of acute intestinal obstruction*

(8) *Tender irreducible swelling at an hernial orifice with acute intestinal obstruction syndrome = strangulated hernia*

(9) *In every case of acute intestinal obstruction, examine every hernial orifice*

(10) *Principal factor in mortality in strangulated hernia is delayed operation or ill applied taxis*

(11) 2–4% of inguinal, 25–30% of femoral, 15–20% of umbilical and 3–5% of incisional herniæ get strangulated

(12) Strangulated inguinal hernia preponderates in males 8 : 1
" femoral " " " females 4 : 1
" umbilical " " " " 6 : 1

(13) Never allow the septic fluid from the strangulated hernial sac to run into the peritoneal cavity or soak into the surrounding cellular tissues

(a) *Never relieve the constriction before draining the sac*
(b) *Never drain the sac before protecting the wound margins by towels*

(14) *Always be sure of perfect hæmostasis before allowing the omental stump to recede Always transfix the omentum*

(15) *Persistent constriction mark after recovery of the whole strangulated loop Invaginate the ring, but expect stricture as a sequela*

(16) Free omental grafts live except in the presence of gross infection

(17) Always keep hæmostats on both the edges of the uppermost limit of hernial sac incision to avoid extra peritoneal reduction of contents

(18) *Sac isolation from inside is a quicker and better method in experienced hands*
(a) Incision of the sac
(b) Evacuation and reduction of contents
(c) Insertion of a finger inside
(d) Dissection isolation of the sac over the finger

(19) Sac isolation from inside saves trauma to the contents as the isolation of the sac is done after their reduction

(20) '*False neck formation its closure and dealing with the distal portion of the sac later is a time saving measure*

(21) Treatment of the distal sac after ligature of neck
(A) Excision
(B) Puckering obliteration of its cavity
(C) Turning inside out.

(22) Reductio *en masse*
(a) Strangulated hernia
(b) History of reduction by taxis
(c) Persistence of strangulation syndrome.

(23) *On no account relieve the constriction of a strangulated hernia from inside the peritoneal cavity after laparotomy* The patient is sure to die from peritonitis due to entrance of the sac fluid into the general peritoneal cavity Always open the inguinal canal and drain the sac from outside as in ordinary strangulated hernia.

(24) Special conditions in strangulated hernia
(A) Richter s hernia
(B) Maydl s retrograde
(C)
(D)

(25) Gut above the constriction more unhealthy than the gut below = Maydl s retrograde strangulation

(26) *Points about strangulation :*

(A) *Inguinal strangulation most frequently met with*
(B) *Femoral strangulation most frequent complication*
(C) *Umbilical strangulation most serious*

(27) Valuable signs in the diagnosis of strangulated hernia

(a) Increased peristalsis on abdominal auscultation
\+ (b) Tenderness over an hernial aperture

(28) Post operative dangers of strangulated umbilical hernia

(a) Shock
(b) Paralytic ileus
(c) Chest complications

(29) Richter's strangulation is most common in femoral hernia

(30) Grey, sodden patches with complete loss of resilience and fæculent smelling fluid are conclusive proofs of gangrene

(31) Free omental grafts are better than pedicled omental grafts for covering the gangrenous bowel

(32) Some rare contents of strangulated hernial sac

(a) Twisted ovary and tube
(b) Twisted testis
(c) Gangrenous appendix
(d) Meckel s diverticulum
(e) Bladder diverticulum

(33) *Aids to reduction of intestines into the peritoneal cavity*

(a) *Trendelenburg posture*
(b) *Good anæsthesia* relaxation of parietes
(c) Elevation of wound margins
(d) *Deep respirations*
(e) *Methodical gradual manipulations from one end*
(f) Cannula evacuation if distension +

(34) *Limit of safety in novocain anæsthesia is*

(a) *100 c cs of 1 %*
or (b) *250 c cs of 5 %*

(35) Differential diagnosis between

(a) Strangulated femoral hernia
(b) Suppurating gland of Cloquet

(36) Attention to skin is very important, in strangulated umbilical hernia, if virulent cellulitis is to be avoided

(37) *Although division of Poupart's ligament may not weaken the abdominal wall,* it is better to avoid it as far as possible

(38) Treatment of intestines in strangulated hernia

(A) If safe
. Return

4

(B) If doubtful
 (a) Wait and see
 (b) Exteriorize the loop
(C) If gangrenous
 (a) Local purse string and bury
 (b) Constriction ring invaginate
 (c) Regional
  (1) Condition good
   Resection + anastomosis
  (2) Condition bad
   (α) Resection + Paul s drain in each end
   or (β) Proximo lateral anastomosis
    With exteriorization of the loop
  (3) Condition hopeless
   Proximal enterostomy
   With exteriorization of the loop

(39) *Catheterisation is an important part of pre operative preparation of strangulated hernia*

(40) If a hernial sac is much adherent to the surroundings make a 'false neck by cutting all round at the neck and closing it with purse string Leave alone the distal part or turn it inside out

(41) Fascial hernioplasty is out of question after strangulated herniotomy

(42) Strangulated hernia in infancy
 (a) Taxis in 'Judgement of Soloman posture
 (b) Point of obstruction
  (α) External ring in more than half the cases
  (β) Sac constriction at the int ring
 (c) Removal of the sac is enough no hernioplasty

(43) *Midline sub umbilical incision is the most common cause of strangulated incisional hernia*

(44) In post operative peritonitis after strangulated herniotomy, hope lies in immediate laparotomy, dealing with the cause and drainage.

(45) Avoid narrowing of lumen by purse string action of continuous suture by using separate catgut for four layers of suture in end to-end anastomosis of small gut

(46) In lateral anastomosis stumps must be securely invaginated and fixed to adjacent limbs of anastomosis ends being turned in against the intestines

(47) Wilkie s technique in high resections
 Contents of proximal intestine are carried on into distal by a rubber tube joining both the Paul s tubes, fixed on to the ends.

(48) *The viscera drawn down along with an inguinal hernial sac are*
   (*a*) *The bladder*
   (*b*) *The cæcum*
   (*c*) *The left or iliac colon*

(49) *Inspection should never be omitted in the examination for a hernia Small hernias are better seen than felt*

(50) Majority of rounded translucent swellings in the inguinal canal are encysted hydroceles of hernial sacs.

(51) Translucent rounded swelling in the inguinal canal
   (*a*) Hydrocele of the cord
      (α) Congenital
      (β) Infantile
      (γ) Encysted
   (*b*) Hydrocele of the hernial sac.

(52) The main avoidable causes of recurrence after herniotomy are
   (*a*) Hæmatoma
   (*b*) Suppuration
   (*c*) Untreated etiology
   (*d*) Incomplete convalescence

(53) *Commonest sources of trouble after herniotomy*
   (*a*) *Hæmatoma of the scrotum*
   (*b*) *Retention of urine*

(54) Inguinal canal is a muscular sphincter with active contraction when abdominal pressure rises

(55) *Treatment of inguinal hernia*
   (1) *Hernia of infancy*
      (A) *Truss for one to four years*
      ↓ (B) *Simple herniotomy*
         Without division of ext oblique
   (2) *Hernia between 4–12 years*
      Andrews s non transplantation or submuscular cord
   (3) *Hernia after 12 years*
      Bassini with superimposition of ext oblique
   (4) *Large, recurrent hernia with weak muscles*
      Gallie s fascial graft
   (5) *Direct inguinal hernia*
      (*a*) Rectus flap of Bloodgood
      (*b*) *Gallie s fascial graft*

(56) Indications in hernial operations
   (A) Herniotomy
      Early hernia without primary or secondary weakness of inguinal canal
   (B) Herniorrhaphy musculo fascial adjustment
      Moderate hernia with slight weakness of inguinal canal

(C) Herniloplasty incorporation of additional structure
Large hernia with marked weakness of inguinal canal

(57) *Different positions of the cord in herniorrhaphies*
(1) *Submuscular Andrews Halstead*
(2) *Intermuscular Bassini*
(3) *Inter aponeurotic Andrews*
(4) *Subcutaneous Halstead*

(58) The sac of direct hernia should not be opened and that of indirect hernia should be thoroughly isolated to prevent injury to the bladder

(59) *Urinary bladder should be suspected in*
(a) *Mass of adherent fat*
(b) *Muscle bundles*
(c) *Large coursing veins*
} *on medial side of the sac neck*

(60) *In a hernia operation silk gives rise to less sepsis than catgut*, recurrence rate is less too

(61) *Suture of transversalis fascia is the most important step in herniorrhaphy*

(62) *Never cut a muscle across*, separate the fibres and ultimately bring them together in every plastic operation like herniorrhaphy

(63) The last stitch in posterior muscle approximation in hernia operation, should come close to the insertions of conjoined tendon and Poupart

(64) *Reconstructed external abdominal ring must admit tip of little finger*

(65) Suture of conjoined muscle to Poupart unless supplemented by something further is useless and even harmful

(66) Bassini operation
(A) Does too much in (a) Children
(b) Young adults
(B) Does too little in (a) Large indirect hernia
(b) Direct hernia.

(67) *Strangulation of umbilical hernia is*
(a) *Rare in children*
(b) *Common in adults*

(68) Umbilical scar is fully formed 6 months after birth

(69) *Fatal cellulitis of the abdominal wall is common after operation for umbilical hernia and can be prevented by*
(a) Attention to skin preparation
(b) Excision of septic skin island
(c) Drainage for 48 hours.

(70) Midline lower abdominal incision gives rise to strangulated incisional hernia, it may be

(a) Unilocular
(b) Multilocular
Operate as early as possible

(71) Etiology of hernia
A pouch of peritoneum may be forced out by excessive prolonged or oft repeated intra abdominal pressure
(a) Wherever vessels or nerves pass out
(b) Wherever muscles arise or are inserted
(c) Wherever fibrous intersections or septa occur

(72) Sutures through recti muscles unless they are approximating ones without any tension do more harm than good

(73) Strangulated incisional hernia
Signs of complete obstruction are masked Conservatism spells disaster Operate early

(74) Strangulated obturator hernia
(a) Partial or complete intestinal obstruction
\+ (b) Pain radiating to the inner side of the knee

(75) *Every doubtful gluteal swelling should be subjected to open exploration and never to aspiration*

(76) *Two clinical forms of hernia*
(a) *Sudden with strangulation*
(b) *Gradually progressive*

(77) *Most common causes of recurrence in hernia*
(a) *Sepsis*
(b) *Strain*

(78) Complications of hernia
(a) Irreducibility
↓ (b) Incarceration
↓ (c) Obstruction
↓ (d) Inflammation
↓ (e) Strangulation

(79) Remember respiratory and intestinal complications after every operation on ventral hernia

(80) Never undertake a laparotomy lightly in
(a) *Child bearing women*
(b) *Laborious occupations*

(81) *Never take continuous stitches in the abdominal parietes if you want to avoid*
(a) *Burst abdomen*
(b) *Ventral hernia*

(82) *After every laparotomy*
(1) *Avoid straining of any kind for at least a year*
(2) *Abdominal support for 6 months*
(3) *Sterilisation wherever possible*
In women with low laparotomy

(83) Gallie's fascial hernioplasty is best in
- (*a*) Assured aseptic technique
- (*b*) Large hernias
- (*c*) Ventral hernias
- (*d*) Direct inguinal hernias
- (*e*) Recurrent hernias
- (*f*) In absence of strangulation

(84) *Beware of trauma to the intestines in scar hernias at the time of opening the sac*

(85) *Do not operate in hernias which are secondary to non removable strain, unless operation is forced by strangulation*

Main contra indications are
- (*a*) Chronic respiratory strain
  - (α) Chronic bronchitis and bronchiectasis
  - (β) Asthma
- (*b*) Chronic inveterate constipation
- (*c*) Irremovable urinary obstruction

(86) *In every hernia, remove the cause of straining, before or at the time of herniotomy*

(87) *Hernia in a child examine the prepuce.*

CHAPTER IX

THE LIVER

(I) CONGENITAL AFFECTIONS:

(1) RIEDEL'S LOBE

Def Linguiform process attached to the right lobe of the liver
Path May be associated with gall stones
Clinic Mobile can be pushed beyond midline
Diff diag (1) Mobile kidney
(2) Gall bladder

(2) CORSET LIVER

Def Transverse furrow into the liver
Etio Tight corset in females
Clinic (a) Palpable furrow
(b) Pedicled mobile part
Compl Torsion of the pedicle

(3) HEPATO PTOSIS

Def Displacement and undue mobility of the liver
Due to laxity of its ligaments
Etio (1) Congenital
(2) Acquired
Path (a) Dislocated liver partial displacement
(b) Wandering liver free mobility
Compl (1) Association with visceroptosis
(2) Torsion
(3) Drag on surrounding viscera
Clinic (a) Gastro intestinal syndrome
(b) Respiratory syndrome
(c) Cardiac syndrome
(d) Portal pressure syndrome
(e) Biliary syndrome
Signs (1) Palpation
(2) X Rays
Treat (1) Conservative—supports
(2) *Hepatopexy*

(4) CONGENITAL CYSTIC DISEASE
(See cysts of the Liver)

(II) TRAUMA:

(1) CLOSED TRAUMA

Def Injury to liver without breach of skin
Cause Sudden severe blow against the hepatic region
Path (A) **Contusion**
(B) **Laceration**

Effects: (*a*) **Hæmorrhage:**
- (α) Central
- (β) Sub capsular
- (γ) Peritoneal

(*b*) **Secondary infection:**
- · Traumatic hepatic abscess

(*c*) **Aseptic irritative serositis:**
- (α) Peritonitis
- (β) Pleurisy

Clinic. (1) History of trauma
(2) Shock
(3) **Local signs:**
- (*a*) Pain
- (*b*) Tenderness
- (*c*) Rigidity
- (*d*) Associated fracture ribs · if any

(4) **Internal hæmorrhage syndrome:**
- (*a*) General rapid anæmia
- +(*b*) Free fluid in the peritoneum

Sp. signs. (1) **Bradycardia:**
- : Due to absorption of bile

(2) Irritative peritonitis with icterus:
- . If hæmoperitoneum

Compl: (1) **Associated fracture ribs**
(2) **Associated visceral injuries**
(3) **Hæmorrhage:** Internal
- (*a*) Primary
- (*b*) Secondary

(4) **Irritative inflammations:**
- (*a*) Peritonitis
- (*b*) Pleurisy

(5) **Secondary infection:**
- (*a*) Hepatic abscess
- (*b*) Subdiaphragmatic abscess

(6) **Pulmonary embolism**

Treat (A) **Conservative:**

Ind: (*a*) No serious symptoms
(*b*) Too serious condition

Tech. (1) Absolute rest
(2) Morphia
(3) Blood coagulants
(4) Local ice
(5) Blood transfusion

(B) **Operative:**

Ind: (*a*) Progressive symptoms
(*b*) Internal hæmorrhage
(*c*) Peritonitis

Tech: (See under Operations

(2) OPEN TRAUMA

Def Injury to the liver by a penetrating agent

Etio (*a*) Stab wound
(*b*) Gunshot wound
(*c*) Impalement

Path (1) Uncomplicated
(2) Complicated
Associated visceral injuries

Clinic (1) **Hæmorrhage**
(*a*) External
(*b*) Internal
(2) Presence of a wound in hepatic region

Compl (*a*) Hæmorrhage
(*b*) Associated visceral injury
(α) Pleura and lung
(β) Stomach, colon, intestines
(γ) Gall bladder
(*c*) Infection
(*d*) Bile peritonitis

Treat Operative **exploratory laparotomy**
(See under Operations)

(III) ACUTE SURGICAL INFECTIONS.

LIVER ABSCESS

Etio (A) **Portal route** Pylephlebitis
(*a*) **Suppurative appendicitis**
(*b*) **Inflamed hæmorrhoids**
(*c*) Diverticulitis
(*d*) Inflamed carcinoma colon
(*e*) **Amœbic abscess**
(B) **Biliary route**
Suppurative cholangitis
(C) **Trauma** With infection
(D) Direct extension
(*a*) Subphrenic abscess
(*b*) Acute cholecystitis
(*c*) Perforated duodenal ulcer
(*d*) Empyema
(E) Suppurating hydatid
(F) Umbilical route
(*a*) Infected umbilical cord
(*b*) Veins of Sappey
(G) Lymphatics
(H) Hepatic artery general pyæmia

Bact: (*a*) B. coli
(*b*) Staphylococci
(*c*) Streptococci
(*d*) Amœbæ

(A) PYLEPHLEBITIS WITH PORTAL PYÆMIA

Def. Septic portal phlebitis with septic embolism in the liver, leading to multiple hepatic abscesses, primary focus being in the alimentary canal

Etio (1) Suppurative or gangrenous appendicitis
(2) Inflamed hæmorrhoids
And their hasty operative treatment

Morb. anat Liver riddled with small, multiple abscesses
Honeycomb abscesses

Site Right lobe

Clinic (1) Presence of primary focus
(2) Septicæmia
(*a*) Rigors
(*b*) High swinging temperature
(3) Painful, tender, enlargement of liver
(4) Icterus

Diagnosis (1) Rigors with fever
(2) Tender liver
(3) Primary focus

Diff diag (A) Subphrenic abscess
(B) Acute cholecystitis
(C) Charcot s intermittent fever
Obstructive cholangitis

Treat (A) **Prophylactic:**
(1) **Avoidance of**
(*a*) Operation on inflamed piles
(*b*) Meddlesome appendicectomy
(α) Injury to abscess wall
(β) Injury to œdematous omentum
(2) **Ligature of ileo-colic vein:**
Ind Early rigors in acute appendicitis
Steps (A) Ligature of ileo colic vein
2" from ileo-cæcal junction
↓ (B) Appendicectomy
(3) **Intravenous:**
(*a*) Mercurochrome
(*b*) Collosal iodine
(*c*) Prontosil group
(B) **Curative**
(1) **Intravenous therapy:** (See above)

(2) Exploration → drainage
(a) Abscess
(b) Costo hepatic space
Tech (a) Laparotomy
(b) Feel for elevation + induration
(c) Pack off the area
(d) Aspirate
(e) Insert sinus forceps
(f) Drain
(α) Transcostal
(β) Abdominal through the omentum
After treat Semi Trendelenburg position

(B) SUPPURATIVE CHOLANGITIC ABSCESSES

Def Multiple abscesses in the liver secondary to septic obstructive cholangitis
Etio **Obstruction of biliary passages** due to
(a) Impacted stone
(b) Stricture
(c) Growth
(d) Pancreatic lesions
(α) Chronic pancreatitis
(β) Carcinoma pancreas
Path (1) Biliary stasis → cholæmia + enlarged liver
+ (2) Secondary infection → septic toxæmia
Morb anat Multiple abscess cavities containing septic bile
Clinic (1) **Primary biliary obstruction**
(a) Jaundice obstructive
(b) Enlargement of liver
(c) Presence of primary cause of obstruction
↓ (2) **Septic phenomena** Super added
(a) Charcot s intermittent fever
(b) Pain and tenderness over the liver
(c) Toxæmia
Compl (1) Septicæmia
(2) Cholæmia
Diff diag (1) **Portal pyæmia**
(a) Presence of primary focus
(b) Jaundice late and less
(2) **Cirrhosis liver**
Treat (1) Cholecystostomy } after removal of
(2) Choledochostomy } obstruction

(C) TROPICAL OR AMŒBIC ABSCESS

Etio Amœbiasis
Amœbic dysentery
Site Right lobe

Path : (1) Amœbic dysentery (ulcers)
↓ (2) Amœbæ in portal radicles
↓ (3) Amœbic hepatitis
↓ (4) Amœbic hepatic abscess

Morb anat. (*a*) Solitary, extensive
(*b*) Liquified necrosis of liver parenchyma :
Sterile, chocolate-coloured contents
(*c*) Irregular or lobulated cavity
(*d*) Shaggy wall

Clinic (1) Tropical habitat
(2) History or no history of **dysentery**
(3) **Septic toxæmia :**
(*a*) Sthenic intermittent or remittent fever
(*b*) Asthenic cachexia with icterus
(4) **Inflammatory enlargement of liver :**
Pain + tenderness + rigidity
(5) **Basal thoracic signs**
↓ (6) **Local tender swelling :**
(*a*) Hypochondriac or epigastric
(*b*) Lateral costal
(*c*) Posterior costal
↓ (7) Pointing subcutaneous abscess in late cases
(*a*) Abdominal wall
(*b*) Costal

Special signs (1) **Hepatic cachexia :**
(*a*) Greyish yellow colour
(*b*) Icteric scleræ
(*c*) Wasting
(2) **Stool examination :**
Amœbic cysts
(3) **X-Ray :**
Diaphragm raised and immobile
(4) **Blood :**
Leucocytosis without marked polymorphosis
(5) **Aspiration :**
: Chocolate-coloured fluid

Diff. diag (1) **Fevers :** Malaria
(2) **Hepatic conditions :**
(*a*) Amœbic hepatitis emetine test
(*b*) Cirrhosis liver
(*c*) Acute infections of the liver
(3) **Regional conditions :**
(*a*) Subphrenic abscess
(*b*) Cholecystitis
(*c*) Peri gastric abscess

Diff diag between syphilis liver and carcinoma liver ·

Signs	*Syphilis*	*Carcinoma*
Age	20–50	Over 50
General health	Good	Cachexia & asthenia
Tenderness	Absent	Local
Ascitis	Absent	Present
Spleen	Enlarged	Not enlarged

Treat Of syphilis liver
Anti syphilitic except arsenic

(3) ACTINOMYCOSIS
Syn Honey-comb liver
Routes (1) Portal Secondary to ileo-cæcal region
(2) Haematogenous From neck focus
(3) Direct extension From pleura and lung
Morb anat Honey-comb abscesses
Clinic Hepatic abscess syndrome
Treat 10-30 minims of fresh tr iodine in 2 ounces of milk
T D S

(V) CIRRHOSIS OF THE LIVER:

Etio (A) **Portal toxæmia:**
Cause Alcoholism
Clinic Atrophic cirrhosis with **ascitis**
(B) **Biliary cirrhosis:**
Causes (*a*) Calculous obstruction
(*b*) Suppurative cholangitis
Clinic Enlargement of liver with **jaundice**
(C) **Splenic cirrhosis:**
Cause Primary splenic toxæmia
Clinic (*a*) Primarily **enlarged spleen**
(*b*) Liver enlargement late
(*c*) Jaundice variable
(D) **Specific cirrhosis** ·
Cause Syphilis
(*a*) Congenital
(*b*) Secondary
(*c*) Tertiary

Clinic Enlargement → atrophy of liver with
(*a*) Ascitis
or (*b*) Jaundice
or (*c*) Enlarged spleen
or (*d*) Hæmatemesis or bleeding piles

Diff. diag: (1) **Hepatic abscess or cyst**
(2) **Carcinoma**: Secondary
(3) Hepatic displacement:
: Subphrenic abscess
: Empyema
(4) Hepato-ptosis

Treat: (A) **Portal**: (In suitable cases)
(*a*) Talma-Morison
(*b*) Paterson
(*c*) Wynter
: (See under Operations)

(B) Biliary:
: Early biliary drainage
: (Cholecystostomy or choledochostomy)

(C) Splenic:
: Splenectomy

(D) Specific:
: Anti-syphilitic treatment

(VI) TUMOURS:

(A) *Innocent:*
(1) **Angioma**:
: Cavernous hæmangioma
: Small and silent
(2) **Adenoma**: Hepatoma

(B) *Malignant:*
(1) **Carcinoma**:
(*a*) Primary: rare
Etio: Cirrhosis
(*b*) **Secondary**:
Etio: (1) Extension from neighbours:
(α) Gall bladder
(β) Pylorus or cardia
(2) **Metastatic**:
: From alimentary canal:
(*a*) Stomach
(*b*) Rectum
(*c*) Sigmoid
(*d*) Cæcum
: From other organs

Clinic: (1) Enlargement of the liver: extreme
(*a*) Irregular
(*b*) Bossy:
: **Umbilicated** multiple growths
(2) Cachexia
(3) Jaundice: 60%
(4) Ascitis: 58%

Sign: Exploration or peritoneoscopy

(B) Bleeding haemorrhoids
Injection treatment
(C) Ascitis
Ind (a) Alcoholic cirrhosis no syphilis or malignancy
(b) General good condition
(c) No cardiac hepatic or renal failure
(d) History of more than a year
With repeated tappings
Pre oper (1) Estimation of function
(a) Liver
(b) Heart
(c) Kidneys
(2) Administration of
(a) Glucose
(b) Blood coagulants if jaundice
Anæsth Local novocain
Methods (A) Anastomosis between portal and systemic veins
Omentopexy Fixation of omentum into
(a) Extra peritoneal space
or (b) Retro rectus space
Between muscle and sheath
or (c) Subcutaneous space
(B) Constant extra peritoneal drainage
(1) Glass bobbin method Paterson
(2) Silk strands method
(3) Peritoneo-cellular fistula Wynter
Opening peritoneum into Scarpa via femoral canal
(4) Transplantation of saphenous vein into peritoneum
(C) Excision of toxic focus
Splenectomy if splenomegaly
Technique *Of Talma Morison operation for ascitis*
(1) Incision (a) Median epigastric (Omentopexy)
(b) Supra pubic (Drainage)
(2) Scrubbing of (a) Liver
(b) Spleen
(c) Diaphragm
(3) Fixation of spread out omentum to
(a) *Posti surface of rectus sheath*
or (b) Between the sheath and muscle
or (c) Subcutaneous space
(4) Fixation of omentum to peritoneal incision
During its closure
(5) Supra pubic glass tube drain
(6) Closure
After treat (a) High Fowler's posture
(b) Drainage tube
(a) Change glass for rubber
4th day

(β) Remove the drain
10th day
(c) Plenty of glucose and fluids
Post compl (1) Hepatic failure and cholaemia
(2) Pulmonary complications
(3) Uræmia
(4) Cardiac failure
Sequelæ (a) Recurrence
(b) Ventral hernia

(IX) IMPORTANT POINTS

(1) *Bradycardia is an important sign in bile extravasation and absorption*
(a) Jaundice
(b) Perforation of gall bladder
(c) Trauma to the liver

(2) Diagnose acute yellow atrophy of the liver from surgical liver by early and rapid shrinking

(3) Swinging temperature with rigors in the course of acute appendicitis denotes pylephlebitis with portal pyæmia.

(4) *If the hand can be passed between the liver and the diaphragm, the existence of a subphrenic abscess can be eliminated at once*

(5) *Do not enlarge by insertion of finger and do not try to break down the loculi in liver abscess*, as it will produce bleeding

(6) In amœbic abscess of the liver
(a) History of dysentery in 60%
(b) Amœbæ in stools in 36%
(c) Amœbæ in liver pus in 17%.

(7) *The needle can be diagnosed to be in the liver when it oscillates with respiration*

(8) Age in liver affections
(a) Syphilis 20–50
(b) Carcinoma above 50

(9) When jaundice is present blood serum may give a positive Wassermann even in the absence of syphilis

(10) Syphilis of the liver
(a) Single or multiple, localised rounded non umbilicated nodules
(b) Irregularly lobulated liver

(11) *Liver gummata rarely soften, testicular gummata always soften*

(12) Most common causes of liver enlargement
(a) *Cirrhosis*
(b) *Nutmeg liver*

(c) *Amœbic hepatitis or abscess*
(d) Biliary obstruction
(e) Secondary carcinoma

(13) *Most common cause of hæmatemesis is liver cirrhosis*

(14) *Amœbic abscess of the liver*
(a) *Explore 8th or 9th inter costal space in mid-axilla*
(b) *Needle oscillates with respiration*
(c) *Try in different directions*
(d) *Withdraw rapidly*

(15) Chocolate *coloured pus is pathognomonic of amœbic liver abscess*

(16) *In any kind of liver enlargement do not forget syphilis*

(17) Ultimate result of omentopexy for ascitis is not encouraging many cases die of hepatic failure

(18) Secondary carcinoma of the liver, examine for a primary
(a) Stomach
(b) Rectum
(c) Sigmoid
(d) Cæcum
(e) Gall bladder

(19) Turpentine or iodoform pack for hepatic lacerations, Formalin pack for hydatid cyst

(20) *Nodular liver*
(a) *Late cirrhosis*
(b) *Secondary carcinoma*
(c) *Gummata*

(21) *Basal chest complications are extremely frequent in liver infections, reverse is rarely true*

(22) Beware of the patient with a glass eye and an enlarged liver ? Secondary uveal melanoma.

(23) *Most common infections of the liver*
(a) *Amœbic hepatitis and abscess*
(b) *Suppurative cholangitis*
(c) *Portal pyæmia*

(24) *Stab wounds over the hepatic area must always be explored, tamponaded and sutured*

(25) Ligature of the main hepatic artery is followed by necrosis liver

(26) *In every enlargement of the liver, examine*
(a) *The heart*
(b) *The spleen*
(c) *Peritoneal free fluid*
(d) *Feet for œdema*
(e) *Eyes for jaundice*

(27) Acute suppurative conditions round about the liver
- (a) Subphrenic abscess
- (b) Perigastric abscess
- (c) Perinephric abscess
- (d) Basal empyema

(28) Signs of tropical abscess of the liver may be
- (a) Sthenic
- (b) Asthenic

(29) *Every subcutaneous abscess over the right hepatic area and epigastrium suspect hepatic abscess*

(30) Cirrhosis liver
- (a) Not very painful
- (b) Spleen enlarged
- (c) Venous prominence
- (d) History of hæmatemesis or bleeding piles
- (e) Ascitis 50% of late cases.

(31) *Patient with a syphilitic liver is rarely jaundiced or rarely has ascitis*

(32) Excessively large spleen is more in favour of splenic anæmia than of primary liver cirrhosis

(33) Syphilitic liver is very lumpy and irregular and resembles carcinoma liver but it rarely produces clinical symptoms

(34) Syphilis liver
- (a) Age younger than cancer
- (b) No clinical syndrome
- (c) Other stigmata present

(35) *Commonest tumour of the liver is secondary carcinoma*, 90% of the primaries being in the portal area

(36) Hepatic carcinoma is most common between 40 and 70 and is unknown before 22

(37) There is no other disease than secondary carcinoma, in which such a huge liver may be found

(38) Umbilication is pathognomonic of hepatic carcinoma

(39) Not all livers enlarged from malignant disease have palpable nodules.

(40) By far the most frequent cause of long standing jaundice is cancer of the liver, which produces a deeper yellow discolouration of the skin, which goes on to olive green and grey

(41) *In cirrhosis*
There are no (a) *Clay coloured stools*
(b) *Enlarged gall bladder*
(c) *Intense jaundice.*

(42) *Jaundice from gall stone impaction fluctuates, jaundice due to cancer is progressive and permanent*

(13) Rounded, smooth, regular, big, cystic tumours in the abdomen, neither painful nor tender
   (a) Ovarian cyst
   (b) Hydatid cyst
   (c) Mesenteric cyst.

(14) It is excessively rare for hydatids to cause pressure symptom

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CHAPTER X

THE GALL BLADDER AND BILE DUCTS

(I) CONGENITAL AFFECTIONS:

(A) ABNORMAL GALL BLADDER.

(1) **Absence**

(2) **Misplacement:** Transposition

(3) **Duplication**

(4) **Hourglass contraction**

(5) **Embedded:** In liver

(6) **Mobility → Torsion.**

Clinic (a) Elderly females

(b) Acute pain + tenderness + spasm

(c) Enlarged gall bladder

(α) Coming up in a few hours

(β) Appearing and disappearing

Treat Cholecystectomy

(B) ABNORMAL BILIARY DUCTS

(1) **Cystic duct:** (a) Absent

(b) Very short

(c) Very long

(d) Spiral

(2) **Hepatic ducts:** (a) Accessory

(b) Abnormal course

(3) **Common duct obliteration.**

Time End of 2nd week to end of 2nd month

Clinic (a) Persistence of jaundice after 2nd week

(b) No bile in stools

(c) Bile in urine

Diff diag (1) Icterus neonatorum

(a) Disappears within two weeks

(b) Bile present in stools

(2) Haemolytic sepsis

(3) Congenital syphilis

Treat Explore → short circuit

(4) Common duct cyst

Syn Choledochus cyst

Etio Adolescent females

Site Between the junction and the duodenum

Path (a) Achalasia

↓ (b) Obstructive

Clinic (1) Cystic tumour: In right hypochondrium
(2) Biliary obstruction: Jaundice
(3) Duodenal obstruction
(4) X Rays:
(a) Barium meal · displacement
(b) Cholecystography: 'Comma' gall bladder
Compl: (a) Obstructive jaundice
(b) Biliary sepsis · cholangitis
(c) Biliary cirrhosis
(d) Rupture bile peritonitis
Treat (1) Exploration
↓ (2) Excision
↓ (3) Reconstruction around a tube

(C) ABNORMAL BLOOD VESSELS.
(1) **Right hepatic artery:**
Anterior transposition
(2) **Cystic artery:**
(a) Anterior transposition
(b) Variable origin
(c) Accessory artery
(3) **Plexiform veins**

(II) TRAUMA:
(1) GALL BLADDER
Etio. (a) **Subcutaneous ruptures:** Run over accidents
(b) **Stab wounds**
Clinic: (a) Traumatic shock
(b) **Bile peritonitis**
(c) Septic peritonitis
(α) Local
(β) Spreading
Special signs (1) **Slow pulse**
(2) **Jaundice** with wasting
Treat (1) **Exploratory laparotomy**
↓ (2) Treatment of the focus
(A) Basal part cholecystectomy
(B) Fundal part
Purse string cholecystostomy
↓ (3) Peritoneal toilet
↓ (4) Closure with drainage of Morison pouch

(2) BILIARY DUCTS
Etio (a) Accidental
(b) **Post-operative:** Cholecystectomy
Path *Common operative injuries:*
(1) **Blood-vessels:**
(a) Cystic artery: (α) Retraction
(β) Slipped ligature

(b) Right hepatic artery inadvertent ligature
(c) Portal vein needle prick or tear

(2) **Ducts:**
(a) Right hepatic duct: inadvertent ligature
(b) Common hepatic duct: button holing
(c) Common bile duct. button holing
· clamping

(3) **Duodenum.** Accidental perforation

Clinic (A) **Immediate:** Operative diagnosis
(B) **Delayed:** (a) Biliary fistula post operative
(b) Jaundice obstructive

Compl. Peritonitis

Sequela Stenosis with (α) Jaundice
(β) Biliary fistula

Treat (A) *Prophylactic*
(1) Demonstrative dissection of three duct junction
(2) Division of cystic duct as near the gall bladder as possible
(3) Careful cutting of adhesions
(4) Blood vessels
(α) Never clamp before identification
(β) Never cut before clamping

(B) *Curative.* Immediate
(1) **Blood-vessels:**
(a) Hogarth Pringle technique
(b) Lateral ligature for portal vein
(2) **Ducts:**
(a) End to end anastomosis over a tube
(b) External drainage
(c) Ligature with cholecyst enterostomy

(C) *Delayed* Of sequelæ
Bile duct reconstruction
(1) End to end anastomosis after excision
(2) Choledocho-duodenostomy
(3) Hepatico-enterostomy
(4) Wilm's tube reconstruction method
(5) Walton's duodenal flap method
(6) Implantation of fistula in alimentary canal
(7) Cholecyst enterostomy
(8) Dilatation or incision of stricture

(III) INFECTIONS OF THE BILIARY APPARATUS:

Path (A) *Routes of infection*
(1) Portal circulation
(2) **Systemic circulation:** Intramural sepsis

(3) **Biliary passages:** Septic cholangitis
- (a) Liver
- (b) Duodenum
- (c) Pancreas

(4) **Lymphatics:** Primary lesions
- (a) Stomach
- (b) Duodenum
- (c) Pancreas
- (d) Ileo cæcal: appendix

(5) Direct extension: hepatitis

(B) *Pathological varieties*:

(a) **Acute:**

(α) **Catarrhal:**

Varieties: (1) Catarrhal
(2) Suppurative
(3) Ulcerative
(4) Perforative
(5) Gangrenous

(β) **Obstructive:**

Causes: (1) Torsion
(2) Obstruction. (α) Lumen
(β) Walls
(γ) Outside

Morb. anat: (1) Hydrops
(2) Empyema

(b) ***Chronic:***

(α) **Intra-mural:** Streptococcal
Infection *via* systemic circulation

(β) **Infected cholesterosis:**

Varieties (1) **Strawberry** gall bladder
↓ (2) **Papillomatous** gall bladder

Path: Hepatitis
↓ Less bile acid content
↓ (a) **High bile-cholesterol content:**
↓ More cholesterol absorption
↓ (b) **Altered cholesterol chemistry:**
↓ Prevention of its transport
↓ Accumulation in muc mem

Morb. anat Deposition of cholesterol in muc. mem

(γ) **Gall stones:**
Cholecystitis + cholelithiasis

(δ) ***Septic bile:***
Septic cholangitis

(C) *Pathological factors*
(1) **Infection:** Hæmatogenous
(2) **Obstruction:** Stones, stenosis
(3) **Irritation:** Stones
(4) **Stasis:** Biliary

(D) *Bacteriological varieties.*
(1) **Hæmatogenous:** Streptococcal
(2) Biliary (*a*) B Coli
(*b*) B Typhosus
(*c*) Cl Welchii

(1) ACUTE CHOLECYSTITIS

Etio· (*a*) **Acute catarrhal** infection
(*b*) **Acute obstruction** + sepsis
(α) Torsion
(β) Stone impaction
(*c*) Acute biliary sepsis

Clinic· (1) *Local signs of acute inflammation*
(*a*) **Pain**
(*b*) **Tenderness:**
(α) Tip of the 9th cartilage
Carmalt Jones
(β) Gall bladder area
(Γ) Right hypochondrium
(*c*) **Rigidity:** Right hypochondrium
(*d*) **Murphy:** Catch in breath
(*e*) Gall bladder + or –

(2) *Referred signs*
(*a*) Shoulder girdle pain
(*b*) **Boas:**
Epicritic hyperæsthesia between
11 D and 1 L spines
(*c*) Hiccough

(3) *General signs* septic toxæmia

Diagnosis (1) History or no history of biliary trouble
+ (2) Acute right hypochondritis

Diff diag (A) *Other causes of acute abdomen*
(*a*) Gastric or duodenal perforation
(*b*) Acute appendicitis
(*c*) Acute pancreatitis
(*d*) Acute hepatic abscess

(B) *Acute extra peritoneal causes*
(*a*) Acute pyelitis
(*b*) Pyonephrosis
(*c*) Acute torsion of the kidney

(C) *Extra abdominal causes.*
(*a*) Pleurisy or empyema or pneumonia
(*b*) Pott's disease of the spine

(D) *General causes*
- (a) Septic fevers
- (b) Specific fevers
- (c) Tabetic crises

Compl. (1) **Empyema of the gall bladder:**

Path Impaction in the cystic duct + infection

Clinic
- (a) Pain
- (b) Tenderness
- (c) Palpable swelling
- (d) High remittent or intermittent pyrexia
- (e) Leucocytosis > 15000

Treat
- (A) Cholecystostomy
- (B) Cholecystectomy

(2) **Perforation of the gall bladder**

Etio
- (a) Acute cholecystitis
- (b) Typhoid and para typhoid gall bladder

Clinic
- (A) Acute general peritonitis
- (B) Sub acute (a) Local peritonitis
  - ↓ (b) Peritoneal abscess
- (C) Chronic internal biliary fistula

Diff diag
- (1) Acute abdomen
- (2) Basal thoracic lesions

Special sign **Bradycardia:** Due to bile absorption

Treat
- (1) Exploration
- ↓ (2) Cholecystostomy
- ↓ (3) Drainage of the abscess
- ↓ (4) Drainage of peritoneal cavity

(3) **Gangrene of the gall bladder**

(4) **Cholangitis**

(5) Suppurative pylephlebitis

Treat Of acute cholecystitis

(I) **Expectant:**

Ind
- (a) Mild local attack
- (b) Acute cholecystitis seen after 48 hours
  - (α) Stationary signs
  - (β) Receding signs
- (c) Preoperative preparation
- (d) Complications + bad condition

Tech (A) **Give.**
- (1) Rest in bed in Fowler position
- (2) Morphia S O S
- (3) Complete starvation for 36 hours
- (4) Local heat

(5) Intravenous:
(a) Saline with glucose
(b) Cylotropin:
: 5 c cs. once a day for 3 days
: Then on alternate days
(6) Oral:
· Glucose, soda-bi carb, fluids

(B) **Avoid:**
(1) Purgatives
(2) Enemata
(3) Local examinations

(C) **Keep:**
(1) Chart of: (a) Pulse
(b) Temperature
(c) Respirations
(d) Local condition
(e) Jaundice
(2) Examination reports of
(a) Urine
(b) Stools
(c) Blood
(d) Chest

(II) **Operative:**
Ind (a) **Acute cholecystitis:**
: Seen within 48 hours
(b) **Failure of conservatism:**
(α) Persistence of acute local signs
(β) Persistence of acute toxæmia
(γ) Rising leucocytosis > 20000
(c) ***Uncertain diagnosis***
Tech (1) **Cholecystostomy**
(2) **Cholecystectomy:**
Ind Within 48 hours of acute attack
Contraind Jaundice

(2) CHRONIC CHOLECYSTITIS
Etio (a) *Systemic infection* ***intra-mural steptococcal***
(b) Infected cholesterosis
(c) **Gall stones**
Morb anat (1) Adhesions
(2) Opacity and thickness of the wall
(3) Subserous deposition of fat
(4) Enlarged sentinel gland
(5) Hepatitis and perihepatitis
(6) Thick tarry bile with biliary gravel
(7) Abnormal size

(a) Big: (α) Hydrops
(β) Empyema
(b) Small or obliterated cavity
(8) Internal fistulæ
(9) Gall stones

Clinic: (1) **Silent syndrome:**
Accidental find during operation
(2) **Septic focus syndrome:**
Typhoid gall bladder
(3) **Alimentary syndrome:**
Flatulent dyspepsia
(4) **Local syndrome:**
(a) Sub acute or chronic hypochondritis
Pain + tenderness + spasm
(b) Distended gall bladder
(c) Cholelithiasis
(α) Biliary colic
(β) Obstructive jaundice

Signs (1) **Murphy:** (See above)
(2) **Boas:** (See above)
(3) **Carmalt-Jones:** (See above)

Special signs (A) **X-Rays:** (a) Plain
(b) Cholecystography (Graham)
(c) Barium meal
(B) Gastric test meal hyperchlorhydria

Associations (1) **Peptic ulcer**
(2) **Appendicitis**
(3) Pancreatitis
(4) **Gall stones**
(5) Hepatitis

Diff diag (A) *Any other cause of dyspepsia*
(a) **Peptic ulcer**
(b) Gastritis
(c) **Appendicitis**
(d) Pancreatitis
(e) Hepatitis
(B) *Regional inflammations*
(a) Hepatitis or hepatic abscess
(b) Sub phrenic abscess
(c) **Kidney lesions**
(d) Colitis
(C) *Various colics.*
(a) Biliary colic
(b) Intestinal colic
(c) Renal colic

Compl (1) Gall stones
(2) Obstructive jaundice
(3) Internal biliary fistula
(4) Carcinoma

Treat (1) *Medical*
(a) **Eradication of septic foci**
(b) Treatment of obesity
(α) Exercises
(β) Dieting
(γ) Thyroid
(c) Cholesterol free diet
Avoid eggs and butter
(d) Cream and milk every hour
(e) Medicinal
(α) Hexamine ℞

Hexamine	grs.	100
Soda bi carb	grs	60
Soda citras	grs	60

In water or milk T D S

(β) **Felamine** Two tablets T D S
(γ) Choleflavine
(δ) Laxatives
(1) Epsom salts every morning
(2) Olive oil
Two tablespoonfuls T D S
(f) Injections cylotropin 5 c.cs once a day
(α) Intramuscular
(β) Intravenous

(2) *Operative* **Cholecystectomy**
Ind (a) Any morbid anatomy of the organ
(b) Symptomless gall bladder
(α) Containing stones
(β) Acting as septic focus
(γ) Acting as typhoid carrier
(c) Chronic well defined syndrome

Contraind (1) Obstructive jaundice
With or without sepsis
(2) Bad general condition

(3) CHOLANGITIS

Def Inflammation of biliary ducts

Etio **Obstruction to the out flow of bile**
(a) Impaction of a gall stone
(b) Growth of a biliary duct
(c) Lesions of pancreatic head

Path Obstruction + Infection

↑ Morb anat (a) Enlarged bile stained liver
With multiple pin head abscesses
(b) Dilated biliary ducts
(c) Bile stained pus
(d) Cause of obstruction

Clinic **Charcot's intermittent hepatic fever:**
(a) Obstructive jaundice + enlarged liver
↓ (b) Complicating
(1) **Rigors with steeple-chart fever**
(2) Toxæmia
(3) Tender and painful liver

Treat **Exploration**
↓ **Biliary drainage.**
(a) *Cholecystostomy*
or (b) **Choledochostomy**
\+ (c) Drainage of Morison pouch

Post compl. (1) Hepatic failure
(2) Cholæmia
(3) Septic toxæmia

(IV) TYPHOID GALL BLADDER:

(1) Acute cholecystitis
Perforation common
(2) *Sub-acute cholecystitis*
(3) Chronic cholecystitis
Gall stones
(4) Typhoid carriers
Stool examination

***Treatment** Of typhoid gall bladder*
(A) **Medicinal:** Hexamine and vaccines
(B) Surgical (a) Cholecystectomy
\+ (b) Choledochostomy

(V) CHOLELITHIASIS:

Etio Fat, fertile, flatulent female of forty

Path (A) *Factors*
(1) **Metabolic:**
(A) **Cholesteræmia:**
(a) Pregnancy
(b) Acholuric jaundice
(B) **Hypercalcæmia:**
Parathyroid adenoma
(2) **Local:**
(A) **Cholesterosis of gall bladder:**
Abnormal cholesterol absorption

(a) Strawberry gall bladder
↓ (b) Papillomatous gall bladder
↓ (c) Cholesterol stone

(B) **Biliary stasis**: Due to
(α) Concentration
(β) Obstruction

(C) **Infection**: Of
(a) The gall bladder
(b) The bile

(D) **Regurgitation of pancreatic juice**:
↓ (a) Precipitation of cholesterol
↓ (b) Cholesterol stone

(E) **Foreign body**:
(a) Bacteria & parasites
(b) Ligatures

(B) *Types*

(1) ***Metabolic***:

(A) **Pure pigment stone**:
Comp Calcium bilirubinate
Appearance Biliary mud
Multiple, small, gritty

(B) **Pure cholesterol stone**:
Comp Cholesterin
Etio Cholesteræmia
Path Cholesterosis of gall bladder
Appearance Single, medium sized or large
Smooth or mulberry like, silent

(C) **Calcium carbonate stone**: (Rare)
Appearance White, chalky

(2) **Inflammatory**: Mixed stone
Comp. Pigment + cholesterol + calcium
Etio (a) Bile stasis. pigment
\+ (b) Cholesteræmia cholesterol
\+ (c) Inflammation calcium
Appearance Multiple, faceted

(C) *Gall stone theories*

(1) **Metabolic theory**:

(a) **Cholesteræmia**:
(α) Pregnancy
(β) Acholuric jaundice
(γ) Diabetes
(δ) Arterio sclerosis

↓ (b) **Cholesterosis** of gall bladder
(α) Strawberry
↓ (β) Polypoid

↓ (c) **Gall Stones:**
(α) Pure cholesterin
(β) Pure pigment

(2) **Inflammatory theory:**
(a) Infective **inflammation** of gall bladder
↓ (b) **Deposition of calcium**
+ (c) **Precipitation of cholesterin** Due to
(α) Less bile acids
(β) Diminished cholesterol absorption
↓ (d) **Mixed stone**

Complication factors

(1) **Irritation.**
(a) Inflammation
↓ (b) Ulceration
↓ (c) Perforation

(2) **Obstruction:**
(A) Ducts (a) Gall stone colic
(b) Obstructive jaundice
(B) Gall bladder Hydrops
(C) Liver (a) Enlargement
↓ (b) Failure white bile

(3) **Infection·**
(A) Ducts suppurative cholangitis
(B) Gall bladder acute or chronic cholecystitis
(C) Liver pylephlebitis → portal pyæmia

(4) **Obstruction + Infection:**
(A) Ducts suppurative cholangitis
(B) Gall bladder acute or chronic empyema
(C) Liver portal pyæmia

(5) **Perforation.**
(A) External fistula
(B) Peritonitis local or spreading
(C) Internal fistula

Sequelæ (1) **Biliary fistulæ:**
(a) External (α) Spontaneous
(β) Surgical
(b) Internal spontaneous

(2) **Stricture:**
(a) Gall bladder (α) Hour glass
(β) Obliterated
(b) Ducts due to (α) Impaction
(β) Post operative traumatic

(3) **Peritonitis:** Due to (a) Perforation gall blad
(b) Gangrene gall bladder
(c) Intestinal obstruction

(4) **Intestinal obstruction**

Causes (a) Impacted gall stone
(b) Adhesions

Sites (1) Lower ileum — stone impaction
(2) Duodenum } adhesions
(3) Colon }

Clinic *Of stone impaction*
(a) Inaugural gall stone dyspepsia
↓ (b) Local hypochondritis
↓ (c) Repeated intestinal colic
↓ (d) Acute intestinal obstruction

Diag Acute intestinal obstruction
In a fat elderly dyspeptic lady

Treat Exploration

(5) **Pancreatitis** Acute or chronic

(6) ***Hepatitis***

(7) **Carcinoma**

Various conditions of the gall bladder associated with stones

(A) **Acute cholecystitis**
(a) Catarrhal cholecystitis
(b) Hydrops or empyema
(c) Perforation
(d) Gangrene

(B) **Chronic cholecystitis**
(a) Catarrhal cholecystitis
(b) Hydrops or empyema
(c) Fibrosis
(d) Adhesions
(e) *Fistulæ*
(f) Carcinoma

(C) **Latent cholecystitis**
Cholesterosis of gall bladder

(D) **Normal gall bladder**

Clinical features

(1) *Latent syndrome*

(2) *Digestive syndrome*
Flatulent dyspepsia

(3) *Local syndrome*

(A) **Gall stone colic**
(a) Sudden onset and end
(b) Repeated colicky pain + vomit + shock
(c) Shoulder tip pain
↓ (d) Jaundice if stone in the ducts
(α) Hepatic
(β) Common

(B) **Inflamed gall bladder:**
Local pain + tenderness + spasm

(4) *Complication syndrome*
(A) Acute or chronic **cholecystitis**
(B) Acute or chronic **gall bladder enlargement**
(C) Acute or chronic obstructive **jaundice**
(D) **Infective** complications

(5) *Sequelæ syndrome* (See above)
(A) Carcinoma gall bladder
(B) Pancreatitis

Signs (1) **Right hypochondritis:**
Pain + tenderness + spasm
(2) **Enlarged gall bladder:**
With no jaundice
(3) **Murphy's** sign
(4) **Boas's** sign

Diagnosis. (A) **X-Rays:**
(1) Plain X Ray
Positions (*a*) Antero posterior
(*b*) Lateral
Shadows Wedding ring
Cuboidal
Triangular
Multiple
Uniform size
Anterior to vertebral shadows
Outside the kidney area
(2) Barium meal
Persistent duodenal deformity
(3) Cholecystography
Tech Administration of Tetra iodo-phenolphthalein
(*a*) Oral 4 5 gms
(1) First plate 12 hours after
(2) Second plate 15 hours after
(3) Third plate 18 hours after
(*b*) Intravenous
3-4 gms in 50 c.cs. distilled water
(1) First plate 4 hours after
↓ (2) Second plate 8 hours after
+ (3) Give fatty meal
↓ (4) Third plate 11 hours after
Shadows Defective filling
Poor concentration
Delayed emptying
Distorted gall bladder
. Mottling Negative stone-shadows

(B) Duodenal intubation :

Tech : (a) Introduction of Einhorn upto 28.5"
↓ (b) Instillation of 60 c.cs. of 25 % mag. sulph
↓ (c) Aspiration of bile.
(α) Excessive mucus
(β) Pus cells
(γ) Cholesterin crystals
(δ) Bacteria

Clinical groups :

(A) *Quiescent syndrome* . infection absent
(1) **No jaundice :**
(a) Gall bladder +
(b) Stone in cystic duct
(2) **Jaundice :**
(a) Gall bladder —
(b) Stone in hepatic or common ducts

(B) *Acute syndrome* Infection present
(Same as above)
(1) *Stone in gall bladder*
(a) No jaundice
(b) Gall bladder . + or —
(2) *Stone in cystic duct* .
(a) No jaundice
(b) Gall bladder +
(3) *Stone in hepatic or common duct ;*
(a) Jaundice
(b) Gall bladder —

Impaction syndrome :

Site	*Colic*	*Jaundice*	*Gall bladder*	*Liver*
Gall bladder	—	—	+ or —	—
Cystic duct	+ or —	—	Acute mucocele	—
Hepatic duct	+	+	—	+
Common duct	+	+	—	+

(A) *Impaction without infection* .
(1) **Hartmann's pouch or cystic duct :**
: Acute mucocele of the gall bladder
: (a) Gall bladder + +
(b) Liver —
(c) Jaundice —

(2) **Hepatic or common bile duct:**
- (a) Repeated biliary colic
- (b) Gall bladder —
- (c) Liver +
- (d) Jaundice + and fluctuating

(B) *Impaction with infection*

(1) **Hartmann's pouch or cystic duct:**

Acute empyema of the gall bladder
- (a) Acute right hypochondritis
- (b) Liver —
- (c) Jaundice —

(2) **Hepatic or common bile duct:**

Suppurative cholangitis (See above)
Charcot's intermittent hepatic fever
- (a) Gall bladder —
- (b) Liver inflammatory enlargement
- (c) Jaundice +
- (d) High intermittent fever

Common sequelæ of stone impaction in common duct

(1) **Liver inefficiency:** White bile
(2) **Suppurative cholangitis:** Charcot's fever

Treatment Of gall stones **Operative**

Ind (a) Failure of medical treatment
(b) Onset of complications
(c) Removal as a septic focus typhoid

Contraind (a) Senility, debility, obesity
(b) Cardio vascular or renal disease
(c) Pregnancy

Time to operate
- (a) Interval time
- (b) After pre operative preparation
- (c) Acute urgent complication
  - (α) Infection
  - (β) Progressive obstruction

Choice of operation

(1) *General condition of patient:*
- (a) Good radical measures
- (b) Bad temporary measures (palliative)

(2) *Jaundice*

(A) Operate immediately if
- (a) Jaundice immediate after colic
- (b) Persistent jaundice with intense pain
- (c) Jaundice with wasting

(B) Temporise if:
(a) Mild jaundice
\+ (b) Recurrent attacks of:
Biliary colic + jaundice

(3) *Position of the stone:*
(A) **Impaction + infection:**
(a) Cholecystostomy
or (b) Choledochostomy
\+ (c) Morison pouch drain

(B) **Impaction without infection:**
(a) Stone in gall bladder or cystic duct only:
(α) If no jaundice
Cholecystectomy
(β) If jaundice
Cholecystostomy
(b) Stones in gall bladder + common duct:
(α) Removal of the gall bladder stone
\+ (β) Removal of common duct stone
\+ (γ) Cholecystostomy
\+ (δ) Choledochostomy
(c) Stone in common duct only:
(α) Removal of the stone
\+ (β) Choledochostomy

(4) *Pathology found at the operation*
(A) **Numerous adhesions:**
(a) Removal of stones
\+ (b) Cholecystostomy

(B) **White bile:**
Two stage operation
(a) Cholecystostomy or choledochostomy
↓ (b) Removal of stones

(C) **Only gall bladder affected:**
Cholecystectomy

(D) **Bile duct pathology:**
(a) Remove the stone
\+ (b) Drain via (α) Gall bladder
(β) Bile duct
(c) *Never do cholecystectomy*

(E) **Presence of jaundice:**
(a) Always explore the ducts
(b) Remove the stones
(c) Drain
(d) *Never do cholecystectomy*

(F) **Presence of sepsis:**
. Drainage only
(a) Bile stained discharge:
: Simple drainage

(b) Bile less discharge
(α) Removal of stone
+ (β) Drainage

Technique of operation (See under operations)

Post operative treatment and complications (See under operations)

(VI) NEW GROWTHS OF BILIARY APPARATUS

(1) CARCINOMA GALL BLADDER

Etio Women above 50

Causes (a) Gall stones in more than 90% cases
(b) Chronic cholecystitis

Sites (1) Fundus
(2) Body
(3) Neck

Macroscopy (a) Local irregular tumour } Infiltrating
(b) Diffuse thickening }
(c) Fungating villous
(d) Fibrotic

Microscope (1) Columnar
(2) Squamous irritative metaplasia

Clinic (1) History of chronic cholecystitis or gall stones
(2) Hard nodular tumour
(a) Clinical finding
(b) Operative finding

Diff diag (a) Chronic cholecystitis
(b) Cholelithiasis
(c) Carcinoma stomach
(d) Carcinoma colon

Compl (1) Fistulæ
(2) Adhesions
(3) Infiltration into surrounding viscera
(4) Obstructions (a) Biliary
(b) Pyloric
(c) Colon
(5) Malignant peritonitis

Treat (A) Exploratory laparotomy
↓ (B) Treatment of the focus
(a) Intra-cholecystic carcinoma
Cholecystectomy
(b) Local involvement of liver
(α) Cholecystectomy
+ (β) Wedge resection of liver
(c) Extensive involvement
Leave alone

(2) CARCINOMA BILE DUCTS

Etio Bile stone

Path : Low malignancy
: Small size
: Slow growth
: No metastases

Clinic : (1) **Insidious, progressive, persistent, painless jaundice** : Yellow → olive green → grey

(2) **Gall bladder : Distended**
- (a) Hepatic duct gall bladder —
- (b) Duct confluence .
  - . Mucocele of the gall bladder
- (c) Common duct
  - . Cholocele of the gall bladder

(3) **Liver : Enlarged**

Diff. diag · (1) Stones in the duct
(2) Duct stenosis
(3) Pressure obstruction :
- (a) Chronic pancreatitis
- (b) Carcinoma pancreas
- (c) Carcinoma stomach
- (d) Sub hepatic abscess

(4) Kinking of the duct
Mobile kidney

Compl : (a) **Cholæmia** with hepatic failure
(b) **Biliary infection**
(c) Hæmorrhage

Treat (1) **Excision** : Where possible
↓ (2) **Short circuit** : Cholecyst enterostomy

(A) Carcinoma ampulla of Vater
- (a) *Operable* . Excision
- (b) *Inoperable* Cholecyst jejunostomy

(B) Carcinoma common bile duct .
- (a) *Operable*
  - (α) Excision
  - ↓ (β) Ligature both ends
  - ↓ (γ) Cholecyst gastro or duodenostomy
  - *or* (γ) *Choledocho duodenostomy*
- (b) *Inoperable*
  - (α) Cholecyst-gastrostomy
  - (β) Hepaticostomy

(C) Junctional carcinoma .
- (a) *Operable*
  - (α) Excision + cholecystectomy
  - (β) Ligature of distal end
  - (γ) Hepatico-duodenostomy
- (b) *Inoperable* :
  - ; Cholecyst-gastrostomy

(D) Carcinoma common hepatic duct ;
: Hepaticostomy

(VII) BILIARY FISTULAE

Varieties (1) **External**
(2) **Internal**
(A) **Pathological** or spontaneous
(*a*) External at the umbilicus
(*b*) Internal (α) Stomach
(β) Duodenum
(γ) Colon
(B) Traumatic or **post operative**
(*a*) Post cholecystostomy
(α) Mucoid cystic duct obstruction
(β) Biliary common duct obstruction
(*b*) Post cholecystectomy
Injury to common duct

Causes (1) **Pathological**
(A) Gall stones
(B) Carcinoma (*a*) Gall bladder
(*b*) Stomach
(*c*) Colon
(C) Duodenal ulcer
(2) **Post operative**
(A) Trauma to biliary ducts
(B) Drainage in **non removed obstruction**
(*a*) Calculus
(*b*) Stricture
(*c*) Pancreatitis
(*d*) Carcinoma

Clinic (1) History of biliary trouble or operation
(2) Fistula right upper abdomen
(3) Discharge
(*a*) Mucoid (α) Mucocele of the gall bladder
(β) White bile hepatic failure
(*b*) Bile obstruction to biliary ducts
(*c*) Biliary pus suppurative cholangitis
(*d*) Pus empyema of the gall bladder
(4) Skin irritation or d gestion

Diag (A) Examination of the fistula
(*a*) Site
(*b*) Skin irritation
(B) Examination of the discharge
(*a*) Physical (α) Yellow colour
(β) More flow after
(1) Cholagogues
(2) Fatty meals
(*b*) Chemical (α) Alkaline reaction
(β) Chemical composition

Diff. diag: (1) Gastric fistula: acid reaction
(2) Duodenal fistula. bile + food
(3) Jejunal fistula: bile + food
(4) Enteric fistula: intestinal contents
(5) Colic fistula. fæces
(6) Umbilical sinus: pus
(7) Pleural or peritoneal sinus: pus
(8) Bone or cartilage sinus. pus

Compl: (1) Bile starvation
(2) Skin irritation → digestion

Treatment: External post operative fistula:

(1) **Conservative**: For 8 to 12 weeks
- (*a*) Protective dressings:
  - (α) Emollients vaseline
  - (β) Acid: dilute citric acid
- (*b*) Suction drainage
- (*c*) Biliary antiseptics: Hexamine
  - : Felamine
  - : Cylotropin
- (*d*) Intestinal drainage: Purges
- (*e*) Bile supply
  - : Introduction of bile per rectum

↓ (2) **Pre-operative cholangiography**

↓ (3) **Operative**:
- Ind: (*a*) Persistence for 3 months
  - (*b*) Absence of bile in fæces
  - (*c*) Jaundice on temporary closure
- Tech: (1) Removal of the cause of obstruction
  - \+ (2) Repair of the ducts
  - *or* (3) Short circuit
  - *or* (4) Transplantation of fistula into duodenum

(VIII) OBSTRUCTION OF COMMON BILE DUCT:

Causes: (A) **Lumen**:
- (*a*) **Gall stones** or biliary mud
- (*b*) Ascaris lumbricoides

(B) **Wall**:
- (*a*) Cholangitis
- (*b*) Operative trauma
- (*c*) **Stricture**
- (*d*) New growth

(C) **Outside pressure**:
- (*a*) **Chronic pancreatitis**
- (*b*) **Carcinoma**: Stomach
  - : **Pancreas**
  - : Gall bladder
  - : Colon

(2) Electro coagulation of posterior adherent wall
(3) Approximation of the edges of left out posterior wall
(4) Free omental or round lig graft

(D) *Partial cholecystectomy with drain*
Ind Adhesions

(E) *Removal or cauterisation of mucous membrane only*
Ind Adhesions

(3) CHOLELITHOTOMY

Steps (1) **Exposure** of the whole biliary area
↓ (2) **Isolation** of the field
↓ (3) **Thorough exploration**
By (α) Visual
(β) Tactile
(γ) Instrumental
Of (*a*) Gall bladder
(*b*) Biliary ducts
(α) Right and left hepatic
(β) Common hepatic
(γ) Cystic
(δ) Common bile
(*c*) Pancreatic head
↓ (4) Cholecystectomy
If stones are limited to gall bladder
No pathology of biliary ducts
or (4) **Cholecystotomy**
↓ (5) **Removal of the stones.**
Till bile flows freely
↓ (6) **Cholecystostomy**
+ (7) Treatment of other foci ducts

(4) CHOLECYST ENTEROSTOMY

Varieties (1) Cholecyst gastrostomy
Ind Pyloric ulcer
(2) Cholecyst duodenostomy
Ind Most natural
(3) Cholecyst jejunostomy
Ind (*a*) Carcinoma pylorus
(*b*) Carcinoma Vater
(*c*) Carcinoma pancreas advanced

Indication Irremovable or impermeable common duct obstruct
(A) Diseases of pancreas
(*a*) Chronic pancreatitis
(*b*) Carcinoma pancreas

(B) Diseases of the biliary ducts·
(a) Traumatic stricture
(b) Post impaction stricture
(c) Carcinoma common duct
(C) Diseases of stomach and duodenum
(a) Posterior adherent ulcers
(b) Carcinoma
Steps (1) Exposure and isolation of biliary area
(2) Aspiration of the gall bladder
(a) Thick black bile good
(b) White bile
(α) Hepatic failure
(β) *Obstruction to cystic or hepatic duct*
(3) Examination of the biliary ducts
(4) (A) Cholecyst gastrostomy
(a) Clamping 2" of
(α) Fundus gall bladder
(β) Ant. pyloric wall
(b) Anastomosis
(α) Posterior seromuscular
↓ (β) Incisions 1"
↓ (γ) Posterior through and through
0 or 00 chromic
↓ (δ) Anterior through and through
↓ (Δ) Anterior seromuscular
(c) Omental graft
(B) Cholecyst duodenostomy
As above but no clamps
(C) Cholecyst-jejunostomy
Site 18" from flexure
Tech (a) Posterior
(α) Through mesocolon
(β) Through gastrocolic omentum
(b) Anterior
(α) Anterior to transverse colon
+ (β) Entero anasto between loops

(B) BILE DUCTS

(1) CHOLEDOCHOTOMY AND STOMY.

Ind (a) Biliary stones
(b) Trauma to ducts
(c) Stricture of the ducts
Tech (A) **Moynihan's rotation technique:**
Ind Impacted calculus with
(a) Bad general condition
(b) Extensive adhesions
Steps. (1) Isolation of the biliary field:
. Gauze in the foramen of Winslow

(2) Manual torsion of the duct
(3) Bilateral stay sutures:
: In the duct wall
(4) Incision of the duct wall
(5) Extraction of the stone
(6) Probe exploration of lumen:
: Up and down
(7) Drainage of the duct

(B) **Supraduodenal choledochotomy:**
(1) Exposure of whole biliary area
(2) Thorough examination:
By (a) Inspection
(b) Palpation
(c) Incision
Of (a) Gall bladder
(b) All ducts
(c) Head of the pancreas
(3) Exposure of the common duct
(4) Palpation and milking of stone
(5) Fixation of the duct:
(a) Manual
(b) Stay sutures
(6) Isolation of the duct: by packs
(7) Incision of the duct
(8) Extraction of all calculi
(9) Explore by sound or probe:
Up and down
(10) Dilatation by bougies
(11) Treatment of gall bladder:
Cholecystostomy if:
. (a) Jaundice
(b) Biliary detritus
(c) Biliary sepsis
(d) Unremoved stone
(12) Drainage
(a) Ductal
Ind. (1) Jaundice
(2) Detritus
(3) Unremoved stone
(4) Biliary sepsis
Tech. (1) Small rubber tube:
. passed upwards
: Secured to:
(α) Duct wall
(β) Skin
(2) T tube for weeks:
: In severe sepsis

(3) Arrange the omentum about the tube
(4) Straight course of the tube
(b) Morison pouch always

(C) Retro-duodenal choledochotomy
Ind Impacted stone in 2nd part
With inability to milk it up
Tech (1) Mobilisation of the duodenum
(a) Incision
Kocher's para-duodenal
(b) Stripping up of the duodenum
(2) Identification and isolation of the duct
(3) Incision -> extraction -> exploration
For stones
(4) Drainage
(a) Morison
(b) Down to site of ductal incision

(D) Trans duodenal choledochotomy
(1) McBurney s ampullary choledochotomy
Ind Impaction in ampulla of Vater
Steps (1) Mobilisation of duodenum
(2) Isolation of duodenum
(3) Incision of duodenum
(a) In the long axis
(b) Opposite the ampulla
(4) Incision of ampulla
(5) Extraction of stone
(6) Internal probe exploration of duct
(7) Transverse closure of duodenum
(8) Omental graft
(2) Kocher s transduodenal choledocho duodenostomy
Ind Impacted stone in 2nd or 3rd part
Tech (1) Mobilisation of duodenum
(2) Isolation of duodenum
(3) *Incision of duodenum*
(a) In the long axis
(b) Opposite the ampulla
(4) Inspect & palpate for stone
(5) Incise
(a) The post-duodenal wall
(b) Over the impacted stone
(6) Stay sutures
(a) Lateral
(b) Upper and lower angles
(7) Extraction of the stone

(8) Exploration of the duct
(9) Tie and cut short the stay sutures
(10) Transverse closure of anterior duodenal wall

Pribram's method for stone impacted in retro duodenal common duct

Tech (1) **Rubber drainage tube:**
(a) Without lateral hole
(b) Smaller than duct lumen
Allowing bile to pass along
(c) Down to the calculus
(d) No kink
(e) Water tight junction
↓ (2) ***Lipoidol radiography:***
(Cholangiography)
6 days after
↓ (3) **Ether injections:**
(a) *Few drops to 5 c c*
(b) Several times a day
↓ (4) **Liquid paraffin injections: 1 c.c**
↓ (5) Repeat (3) and (4)

Result Stone dissolved

(2) CHOLEDOCHO CHOLEDOCHOSTOMY

Syn End to end anastomosis

Ind (1) Immediately after division in cholecystectomy
(2) Immediately after resection (a) New growths
(b) Stricture

Steps (a) Temporary tube method
(1) Mobilisation of the duct ends
(2) Exploration of ducts
(3) Interrupted sutures chromic 000 or 000 000
Over a rubber tube withdrawn just before the final suture
(4) *Drainage upto anastomosis for 5 days*
(b) T tube method
(1) Mobilisation of duodenum
(2) Anastomosis over a T tube
Tube *taken out after* 3 weeks
(c) Two tubes method
(1) Hepatic tube for drainage
(2) Duodenal tube for feeding
(3) Glass connection between (1) and (2)
For three weeks

(3) CHOLEDOCHO-DUODENOSTOMY

(A) Lateral choledocho-duodenostomy

Ind (a) Obstruction in low retroduodenal part
+ (b) Great proximal dilatation of the duct

Tech (a) Mobilisation of the duodenum
(b) Anastomosis of (α) Duct
Transverse incision
(β) Duodenum
Vertical incision
(c) Omental graft
(B) Coffey s end to-side choledocho-duodenostomy
(C) Mayo s hepatico-duodenostomy
Tech (1) Curved flap incision in duodenum
(2) Suture of the duodenal opening to
(a) Hepatic duct
or (b) Liver capsule
(3) Approximation of duodenum to liver
(4) Omental graft
(D) Hepatico jejunostomy
Ind Duodenum unavailable
Site 14" from the flexure
(4) DUCT RECONSTRUCTION OPERATIONS
(A) Sullivan s gap anastomosis Over a rubber tube
(B) Walton s anterior duodenal flap Over a rubber tube
(C) Moynihan s post duodenal flap Over a rubber tube
(5) CHOLEDOCHECTOMY
Ind (a) Primary carcinoma
(b) Carcinomatous infiltration
(c) Stricture
Tech (A) First stage Biliary drainage
(a) Choledochostomy
or (b) Cholecystostomy
or (c) Cholecyst-enterostomy
(B) Second stage Excision + ligature both ends
With (a) Cholecyst enterostomy
or (b) Hepatico-duodenostomy
or (c) Reconstruction operations

(III) POST-OPERATIVE TREATMENT

(1) **Hepatic.**
(a) Fluids or saline } by { (a) Mouth
(b) Glucose + (insulin) } by { (b) Rectum
(c) Soda bi carb } by { (c) Veins
N B No intravenous saline in jaundice

(2) **Biliary antisepsis and drainage:**
(a) Epsom salts with calomel
(b) Belladonna
(c) Cholagogues and antiseptics
(See pre operative treatment)

(3) **Dressings·**
(a) Skin protection emollients with citric acid
(b) Suction drain

(c) Morison tube out 4th day
(d) Gall bladder and bile duct tubes 10th day

(4) **Care of the stomach**
Ind (a) Distension
(b) Vomiting
Treat (1) Gastric lavage
(2) Ryle s tube drain

(5) **Care of the chest**
(a) Co or benzoin inhalations
(b) Turpentine or lint camphor to the chest
(c) Inj camphor in oil

(6) **Care of the intestines**
(a) Antiseptics bismuth, carbon
(b) Laxatives calomel, salines
(c) Bile per rectum

(7) **Bile salts + pancreatic extract + enzymes**

(IV) POST-OPERATIVE COMPLICATIONS

(A) *Immediate*
(1) *Shock*
(2) *Hæmorrhage*
(3) Acute gastric dilatation
(4) *Paralytic ileus*
(5) *Acute pulmonary complications*
(6) Cardio vascular failure
(7) Hiccough

(B) *Intermediate*
(7) Peritonitis
(8) *Liver death*
(A) Hepatic
(B) Renal
(a) Hyperpyrexia
(b) Uræmia
(9) Burst abdomen
(10) *Cholæmia*
(11) *Cholangitis*
(12) Sub acute pancreatitis
(13) Local abscesses

(C) *Late*
(14) Chronic pancreatitis
(15) *Overlooked or recurrent gall stones*
(16) *Biliary fistula*
(17) *Recurrence of symptoms*
(a) Post cholecystectomy syndrome
Cause Sphincter spasm
Treat (1) Amyl nitrite inhalations
(2) Glyceryl trinitrate 1/100 gr oral
(b) Adhesions

(c) Stones
(d) Hepatitis
(e) Pancreatitis

(18) *Ventral hernia*

(1) Pulmonary
- (a) Pneumonia
- (b) Bronchitis
- (c) Pleurisy
- (d) Embolism
- (e) Œdema of the lungs
- (f) Collapse of the lungs

(2) Cardiac
- (1) Fibrillations
- (2) Tachy or brady cardia
- (3) Failure

(3) Circulation
- (a) Shock
- (b) Hæmorrhage

(4) Hepatic
- (1) Failure
- (2) Cholæmia

(5) Biliary
- (a) Sepsis cholangitis
- (b) Unrelieved jaundice

(6) Alimentary
- (1) Acute gastric dilatation
- (2) Paralytic ileus

(7) Renal uræmia

(8) Pancreatic
- (a) Chronic pancreatitis
- (b) Asthenia
- (c) Diabetes

(9) Local
- (a) Biliary fistula
- (b) Sepsis
  - (α) Superficial abdominal wall
  - (β) Regional subphrenic abscess
  - (γ) Neighbouring pleurisy
  - (δ) Abdominal peritonitis
- (c) Burst abdomen
- (d) Ventral hernia

(XI) IMPORTANT POINTS

(1) *Temporary control of cystic artery hæmorrhage*
Compression of the lesser omental border between finger in foramen of Winslow and the other finger the front (Hogarth Pringle)

(2) *The first essential step in cholecystectomy is the demonstration of the junction of cystic duct het ttle*

(c) Morison tube out · 4th day
(d) Gall bladder and bile duct tubes · 10th day

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Ind (a) Distension
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(f) Collapse of the lungs

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(2) Tachy or brady cardia
(3) Failure

(3) Circulation (a) Shock
(b) Hæmorrhage

(4) Hepatic (1) Failure
(2) Cholæmia

(5) Biliary (a) Sepsis cholangitis
(b) Unrelieved jaundice

(6) Alimentary (1) Acute gastric dilatation
(2) Paralytic ileus

(7) Renal uræmia

(8) Pancreatic (a) Chronic pancreatitis
(b) Asthenia
(c) Diabetes

(9) Local (a) Biliary fistula
(b) Sepsis
(α) Superficial abdominal wall
(β) Regional subphrenic abscess
(γ) Neighbouring pleurisy
(δ) Abdominal peritonitis
(c) Burst abdomen
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Compression of the lesser omental border between one finger in foramen of Winslow and the other finger from the front (*Hogarth Pringle*)

(2) *The first essential step in cholecystectomy is the clear demonstration of the junction of cystic duct, hepatic duct and the common duct*

(3) Congenital variations in the biliary apparatus and its vascular supply are extremely common and so *nothing should be divided which has not been first clearly identified and demonstrated to an assistant*

(c) Incision
↓ (d) Probing

(20) Ducts should be probed even on suspicion even when no calculi can be palpated in cases where jaundice is present.

(21) Cholecystitis with or without gall stones is by no means to be ruled out as impossible in children under 15, especially in whom previous appendicectomy has been ineffective.

(22) *Cholecystectomy should never be performed unless it is certain that the common bile duct is patent*

(23) Infection of the gall bladder
(a) Intramural haematogenous
(b) Mucous membrane biliary

(24) Cholecystitis and cholelithiasis lead to each other

(25) *Important factors in cholelithiasis*
(a) *Infection*
(b) *Biliary stasis*
(c) *Cholesteraemia*

(26) In gall stones
(a) Jaundice without gall bladder
Stone in hepatic or common duct
(b) Gall bladder without jaundice
Stone in Hartmann or cystic duct
(c) No gall bladder with no jaundice
Stones in the gall bladder

(27) *In carcinoma of common duct or pancreas*
(a) *Gall bladder +*
(b) *Liver +*
(c) *Jaundice +*

(28) *In gall stones jaundice is intermittent or fluctuating, in carcinoma, jaundice is permanent and progressive*

(29) Post-operative non healing biliary fistula
(a) Missed stone in common duct
(b) Injury to the ducts.

(30) *Obstructive jaundice persisting for over 4 weeks in patients who are at or past middle age is due to carcinoma*
(a) Carcinoma biliary duct
(b) Carcinoma head of the pancreas
(c) Carcinoma ampullary duodenum.

(31) Short circuit is best in stricture of the ducts.

(32) *In all cases of jaundice, pre-operative treatment must consist of*
(a) *Blood coagulants*
(b) *Hepatic support*
( ) *Biliary antiseptics*

(33) Cholecystectomy is necessary even when there are no symptoms, in following circumstances
(a) Typhoid carrier
(b) Gall bladder as a septic focus.

(34) Most common post operative complications in biliary operations (a) Acute gastric dilatation
(c) Paralytic ileus
(b) Hepatic inefficiency
(d) Cholæmia
(e) Pulmonary catarrh

(35) Late sequelæ of gall stones
(a) Hepatitis
(b) Chronic pancreatitis
(c) Biliary sepsis cholangitis
(d) Carcinoma.

(36) *In every biliary case*
(a) *See the association between*
(α) *Gall bladder*
(β) *Jaundice*
(b) *See whether the jaundice is*
(α) *Intermittent or fluctuating*
(β) *Permanent and progressive*
(1) Intermittent jaundice + non palpable gall bladder
Stone in (a) Hepatic duct
(b) Common duct
(2) Intermittent jaundice + palpable gall bladder
Stone at three duct junction
(3) Persistent jaundice + palpable gall bladder
(a) Carcinoma common duct
(b) Carcinoma pancreas
(c) Chronic pancreatitis
(4) No jaundice + palpable gall bladder
Stone in (a) Hartmann pouch
(b) Cystic duct.

(37) If perforated duodenal ulcer or high retrocæcal appendicitis cannot be excluded from acute cholecystitis, it is essential to explore immediately

(38) *Uncertainty of diagnosis* and not the fear of perforation, which is rare, *remains the chief indication for acute gall bladder surgery*

(39) Main indications for operation in gall bladder disease
(1) Obstruction to biliary duct jaundice
(2) Biliary sepsis
(3) Recurrent biliary colic
(4) Enlarged gall bladder
(a) Hydrops
(b) Empyema.

(62) Choice of operation in duct trauma
- (*a*) If immediate
  - End to end suture
- (*b*) If late
  - (1) Gall bladder present
    - (*a*) Ligature of ends
    - ↓ (*b*) Cholecyst entero or gastrostomy
  - (2) Gall bladder absent
    - (*a*) Hepatico duodenostomy
    - *or* (*b*) Reconstruction operation

(63) *Intravenous saline should never be given in cases of unrelieved obstructive jaundice* as it leads to interference with kidney functions

(64) A strip of gauze in foramen of Winslow helps to display the common duct and absorb any infected bile

(65) Always leave a strip of rubber dam down to the region of foramen of Winslow in every case of cholecystectomy, it should be brought out through a separate stab wound

(66) Jaundice
- (A) Obstructive
  - (*a*) Stone in common duct
  - (*b*) Carcinoma pancreas
  - (*c*) Chronic pancreatitis
  - (*d*) Carcinoma common duct
  - (*e*) Duct injuries
- (B) Hæmatogenous
  - (*a*) Pernicious anæmia
  - (*b*) Acholuric jaundice
- (C) Hepatic
  - (*a*) Cirrhosis liver
  - (*b*) Syphilis

(67) Cholecystitis in man is due to
- (*a*) Bacterial infection
  - (α) Mural
  - (β) Biliary
- (*b*) Disturbed cholesterol metabolism

(68) Cholesterosis of the gall bladder
- (*a*) Strawberry gall bladder
- ↓ (*b*) Polypoid gall bladder
- ↓ (*c*) Cholesterol stone

(69) Fat, fertile female of forty
- (*a*) Gall stones
- (*b*) Para umbilical hernia.

(70) In a case of suspected gall stones, find out the state of jaundice

(*a*) No jaundice
(*b*) Intermittent or fluctuating jaundice
(*c*) Permanent progressive jaundice

(71) Gall bladder operations
(1) Incisions of choice
(*a*) Midline or *right para median*
(*b*) Right transrectus vertical
(*c*) *Kocher*
(2) Important steps
(*a*) Careful examination of the whole biliary apparatus
(*b*) *Demonstration of three-duct junction*
(*c*) Careful ligature of cystic artery
(*d*) Drainage
(1) Morison always
Upto the duct incisions or duct stump
Keep for 4 days
(2) Duct lumen when jaundice or sepsis
T tube or tube directed proximally
Keep for 10 days

(72) Recurrence of symptoms after gall bladder operations
(1) Adhesions
(2) Missed or recurrent gall stones
(3) Hepatitis degenerated liver
(4) Pancreatitis
(5) Spasm of Oddi
(6) Another abdominal overlooked focus
(*a*) Peptic ulcer
(*b*) Appendicitis

(73) *Most common causes of death after biliary operations*
(*a*) *Shock*
(*b*) *Hæmorrhage*
(*c*) *Acute gastric dilatation or paralytic ileus*
(*d*) *Hepatic inefficiency*
(*e*) *Cholæmia*
(*f*) *Cholangitis*
(*g*) *Renal failure*
(*h*) *Pancreatic asthenia*
(*i*) *Chest complications*

(74) *Physiology of gall bladder*
(*a*) *Secretion of bile per day 800–1400 c cs*
(*b*) *Capacity of gall bladder 30–50 c cs*
(*c*) Concentration power of gall bladder 6–10 times
(*d*) Referred pain in gall stones Scapular region
6–7 Dorsal

(75) In over 60% of patients it is anatomically possible for pancreatic juice to regurgitate into gall bladder The presence of pancreatic juice in the gall bladder seems to cause precipitation of cholesterol with formation of pure cholesterol stone. (Med. Ann 1940)

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(75) In over 60% of patients it is anatomically possible for pancreatic juice to regurgitate into gall bladder The presence of pancreatic juice in the gall bladder seems to cause precipitation of cholesterol with formation of pure cholesterol stone. (Med. Ann 1940)

(76) Hæmorrhagic tendency in obstructive jaundice is due to prothrombin deficiency, which is the result of failure of absorption of vitamin K, which requires bile for its absorption (Med Ann 1940)

(77) *Without bile salts, vitamin K is useless*

(78) Administration of vitamin K with bile salts is better than blood transfusion in obstructive jaundice.

(79) As a rule acute cholecystitis will settle down with expectant treatment and unless seen within first 48 hours or unless there is evidence of suppuration or gangrene, it is better to wait for a quiet interval before operating For chronic cholecystitis, cholecystectomy is better For empyema of the gall bladder, cholecystostomy is safer

(80) Cholangitis due to impacted gall stone
   (*a*) Kehr's external drainage
   (*b*) Czerny's dilatation of Oddi
   (*c*) Jurasz choledocho duodenostomy

(81) *Never be in a hurry to operate upon a patient who has had a recent attack of gall stone colic unless cholangitis is present*

(82) Jaundice means depressed liver function and operation during the condition leads to unexpected death hence *no operation should be undertaken on a jaundiced patient, unless for the relief of the jaundice and then too, minimum possible interference required for the relief of the condition should only be done*, leaving more radical procedures to the next stage.

CHAPTER XI

THE PANCREAS

(I) CONGENITAL ABNORMALITIES:

(A) ACCESSORY PANCREATIC TISSUE

Sites (a) Duodenal wall
(b) Lesser omentum
(c) Meckel s diverticulum

(B) ACCESSORY DUCTS

(C) MULTICYSTIC DISEASE

Associated with similar affection of the kidneys and liver

(II) TRAUMA:

Etio (a) Hits over the epigastrium
(b) Penetrating wounds
(c) Operative trauma
Inclusion of tail in splenectomy ligature

(A) SERIOUS

Clinic Acute traumatic abdomen with
(a) Fat necrosis
(b) Hæmorrhagic peritoneal fluid

(B) SUBACUTE

Clinic (a) History of trauma
(b) Period of interval
(c) Cystic epigastric swelling
Pancreatic pseudocyst

Compl *of pancreatic trauma*
(1) Pancreatitis
(2) Hæmorrhage
(3) Fat necrosis
(4) Pseudocyst
(5) Peritonitis
(6) Retroperitonitis

Treat *of pancreatic trauma*
(A) Conservative
(B) Operative
Ind (a) Acute peritonitis
(b) Local peritonitis
(c) Pseudocyst
Tech (1) Exploratory laparotomy
(2) Opening into lesser sac
(3) Treatment of pancreatic focus
(4) Lesser sac toilet
(5) Lesser sac drainage

Post-compl Burst abdomen

(III) INFLAMMATIONS OF THE PANCREAS:

Routes. (1) **Biliary route:**

Path. (a) Common opening for (1) Bile duct
(2) Pancreatic duct
+(b) Spasm of sphincter of Oddi
+(c) Infected bile
Clinic Acute and subacute pancreatitis

(2) **Lymphatic route:**

Path Ascending infection from
(a) Pyloric glands
(b) Superior mesent glands
(c) Biliary glands
Clinic Chronic pancreatitis

(3) **Hæmatogenous route.**

Etio Mumps
Path Catarrhal parenchymatous

(4) **Contiguity:**

Etio (a) Pyloric ulcer
(b) Duodenal ulcer

(1) ACUTE PANCREATITIS

Def. Auto digestion of pancreatic and peri pancreatic tissues due to liberation of pancreatic enzymes

Etio (1) Traumatic (a) Penetrating wounds
(b) Contusions
(2) **Biliary infection:** Suppurative cholangitis
(3) **Lithiasis:** (a) Biliary calculi
(b) Pancreatic calculi
(4) Post operative (a) Gastric operations
(b) Splenectomy
(c) Nephrectomy
(5) Mumps

Path (a) Cholecystitis, cholangitis, bile stones
↓ (b) Spasm of sphincter of Oddi
↓ (c) Acute retrojection of infected bile
↓ (d) Activation of trypsinogen
↓ (e) Auto digestion of pancreatic tissue
↓ (f) Pancreatic enzymes set free
↓ (g) Peri pancreatitis
+ Hæmorrhagic effusion
+ Fat necrosis
↓ (h) Infection

Special changes. (1) **Acute glossy œdema**
(2) **Fat necrosis:**
(a) Liberated pancreatic enzymes
↓ (b) Saponification of neutral fat
↓ (c) Fatty acids + calcium
↓ (d) Soap

(3) **Blood-stained peritoneal exudate :**
With pancreatic ferments

Path stages (A) **Œdema** pancreas
(B) Hæmorrhage / Infarction / *Necrosis* } of pancreas
(C) **Peritonitis** or abscess

Path types (1) Hæmorrhagic
(2) Gangrenous
(3) Purulent
(*a*) Catarrhal
(*b*) Parenchymatous

Clinic (A) Gall stone diathesis
(B) **Acute abdomen :**
(*a*) **Intense epigastric pain**
(*b*) Retching
(*c*) Tenderness
(*d*) **Absence of rigidity**
(*e*) Free fluid in peritoneum
(C) **General signs :**
(*a*) **Collapse** +
(*b*) **Dusky cyanosis :** Of face and neck
(*c*) Slight jaundice
(D) **Special signs :**
(*a*) Loewi's mydriatic test
(*b*) Cullen
Yellowish discoloration of umbilicus
(*c*) Grey Turner
Yellowish discoloration in loin
(E) **Laboratory tests :**
(*a*) Blood (α) Sugar
(β) **Diastase**
(*b*) Urine (α) Sugar
(β) **Diastase**

Stages (A) **F*irst stage :***
Path **Œdema** pancreas
Clinic. **Violent pain :** Radiating to left shoulder
(B) **Second stage.**
Path (*a*) Hæmorrhage / (*b*) Infarction / (*c*) Necrosis } of pancreas
Clinic **Acute intestinal obstruction syndrome :**
Without arrest of flatus and fæces
(C) **Third stage :**
Path **Peritonitis or abscess**
Clinic. (*a*) Peritonitis syndrome
or (*b*) Epigastric tumour

Diff. diag Any other cause of: (1) **Profound shock**
(2) **Acute abdomen**
(3) **Acute toxæmia**

(1) Gall bladder colic
(2) Renal colic
(3) Heart colic angina pectoris
(4) Perforated peptic ulcer
(5) Acute appendicitis
(6) Acute intestinal obstruction
(7) Acute hæmo peritoneum
(8) Acute pulmonary crisis

Compl (1) Acute epigastritis
(2) Acute general peritonitis
(3) Acute retro peritoneal cellulitis
(4) Sub acute pancreatitis → omental bursitis
(5) Localised abscess
(6) Relapses
(7) Diabetes
(8) Pancreatic asthenia

Treat (I) **Immediate exploratory laparotomy:**
Ind (1) Doubtful diagnosis
(2) Progressively acute signs
(3) Generalised peritonitis
(4) Abscess
(5) Associated obstructive jaundice

Contraind (*a*) Lesser severity
(*b*) Earlier acute stages
(*c*) Marked collapse or cardiac weakness
(*d*) Oliguria or anuria

Anæsth General **Not spinal**

Steps (1) Supra umbilical midline laparotomy
Note (*a*) **Hæmorrhagic peritoneal fluid**
(*b*) **Fat necrosis:**
Benda's test
Intense blue on cupric acetate
(2) Isolation of the operative field
(3) Approach (*a*) Supragastric
(*b*) Infragastric
(4) Evacuation of lesser sac fluid
(5) Incision of peritoneum over the head
(6) Blunt dissection of head from duodenum
(7) Open up retro pancreatic space
(8) Rubber drainage tube
(A) Retro pancreatic space.
Bring it out:
(*a*) Through the omentum
(*b*) Without a kink

(B) Lesser sac
(C) Suprapubic if required

Tech (A) *Condition good*
(1) Pancreatic decompression
(2) Peritoneal toilet
(3) Cholecystostomy
(4) Drainage (*a*) Retro pancreatic
(*b*) Lesser sac
(*c*) Suprapubic

(B) *Condition bad*
(1) Drainage of lesser sac
(2) Suprapubic drainage

(II) Conservative treatment
↓ Delayed surgical interference

Tech (A) **Conservative treatment**
(*a*) Plenty of fluids by mouth and rectum
(*b*) Subcutaneous and intravenous saline
(*c*) Stimulants and ephetonine
When B P is low
(*d*) Peristaltics
(*e*) **Morphine and atropine**

↓ (B) **Surgical interference**
Ind Omental abscess
Tech Open by resection of twelfth rib

Post treat (*a*) Keep the retro pancreatic tube for 6 days
(*b*) Diet (α) Pancreatised food
(β) Withhold fats

Post compl (1) **Burst abdomen**
Path Digestion of the wound
By pancreatic ferments
Clinic Falling apart of incisional margins
Treat Paraffin molle + 2% Hcl

(2) **Skin irritation**
Path Irritation by pancreatic and biliary discharge
Clinic Excoriated skin
Treat Emollients with 2% Hcl

(3) **Splenic and mesenteric thrombo phlebitis**

(4) **Relapses** Due to
(*a*) Acute or sub acute recurrences
(*b*) Gall stones
(*c*) Oddi spasms
(*d*) Duodenal ulcer

(5) **Pancreatic asthenia**
Time 2nd to 9th post operative day

Clinic (a) Mask-like face with cyanosis
(b) Debility, wasting
(c) Anorexia, salivation, vomiting
(d) Drawling voice
(e) Circulatory depression: B. P. —

Treat. (1) Blood transfusion
(2) Pancreatic extracts

(6) **Pancreatic or biliary fistula**

(2) SUB-ACUTE PANCREATITIS

Path: (A) **Milder acute pancreatitis**
(B) **Local sequela of acute pancreatitis**

Clinic: (a) Signs of acute pancreatitis (See above)
↓ (b) **Omental bursitis:**
(α) Localisation of signs and symptoms
↓ (β) Epigastric retrogastric tumour

Treat: **Drainage:** Of the lesser cavity

(3) CHRONIC PANCREATITIS

Etio: Biliary lithiasis or sepsis

Path (a) Chronic retrojection of bile
or (b) Ascending lymphatic sepsis
or (c) Pancreatic calculi
or (d) Direct extension from peptic ulcer

Morb. anat. (1) Interstitial interlobular
(2) Interacinar → diabetes

Clinic types (1) **Obstructive jaundice:**
(a) Persistent, progressive, painless
(b) Gall bladder +
(c) Liver +

(2) **Gall stone syndrome:**
(a) Biliary colic with jaundice
↓ (b) Post operative recurrence of symptoms

(3) **Recurrent epigastric pain**
(4) **Chronic dyspepsia**
(5) **Debility with diabetes:**
(a) Progressive loss of weight
\+ (b) Glycosuria and glycæmia
(6) **Latent**

Signs (a) Enlarged pancreatic head
(b) Enlarged gall bladder
(c) Enlarged liver

Laboratory (A) **Defective external secretion:**
(a) **Azotorrhœa:** Kashiwado
Undigested nuclei in fæces
(b) **Steatorrhœa:**
Undigested fat in fæces

(c) Failure of starch digestion
(d) Coope's test
Undigested meat in fæces
(e) Sahli's test
Salol → no salicyluric acid

(B) **Defective internal secretion:**
(a) Glycosuria
(b) Diminished sugar tolerance
(c) Loewi's mydriatic test

(C) **Pancreatic disintegration:**
(a) Diastase index
(b) Cammidge osazone crystals

Diff diag (1) **Carcinoma head of the pancreas**
(2) **Carcinoma biliary duct**
(3) Causes of dyspepsia
(4) Causes of jaundice
(5) Diabetes

Treat: (1) **Operative:**
Ind Local mass with or without jaundice
Operative findings (a) Enlarged liver
(b) Enlarged gall bladder
(c) Enlarged pancreatic head
(d) Adhesions
Tech (a) **Biliary drainage:**
(A) External
(a) Cholecystostomy
(b) Choledochostomy
(B) Internal
(a) Cholecyst gastrostomy
(b) Cholecyst duodenostomy
(c) Cholecyst jejunostomy.
With loop anastomosis
(b) **Treat biliary sepsis and lithiasis**
(2) Pancreatic extract
(3) Insulin therapy

(IV) PANCREATIC CALCULI:

Path Calcium carbonates
Calcium phosphates
Site Head of the pancreas (occasionally along the ducts)
Clinic (a) Chronic pancreatitis of the head
Jaundice
(b) Stone colic
Pain + vomiting
(c) X Rays
Good shadows
Treat Removal

(V) PANCREATIC CYSTS:

Varieties: (A) *True cysts*.

(1) **Acinous:**
- (*a*) Retention
- (*b*) Cystadenoma
- (*c*) Multicystic disease (congenital)

(2) **Inter-acinous:**
- (*a*) Lymphatic
- (*b*) Parasitic
- (*c*) Dermoid
- (*d*) Hæmorrhagic

(B) *Pseudocysts*

Path Encapsulation of extravasated fluid in
- (*a*) Omental bursa
- *or* (*b*) Peri pancreatic cellular tissues

(1) **Intra-peritoneal:**
- (*a*) Traumatic
- (*b*) Pancreatitic

(2) **Retro-peritoneal:**
- (*a*) Necrotic
- (*b*) New growth

Path. Presence of one or all of the pancreatic enzymes in fluid

Clinic: **Supra-umbilical cystic swelling:**
- (*a*) History of pancreatitis or epigastric trauma
- (*b*) Transmitting aortic pulsations

Compl. Pressure on common bile duct
↓ Obstructive jaundice

Treat (A) **Exploration:**
- (*a*) Supra gastric
- (*b*) Inter-gastrocolic
- (*c*) Mesocolic

↓ (B) Treatment of the cyst:
- (*a*) **Drainage:**
  - (α) **Posterior:** Left sub costal space
    Outer border of erector spinæ
  - (β) Anterior
- (*b*) **Marsupialisation**
- (*c*) **Enucleation**

Points (1) **Do not aspirate a pancreatic cyst**
(2) Save superior mesenteric artery

Post. treat Protective dressings

(VI) PANCREATIC FISTULA:

Etio: (*a*) Trauma
(*b*) Operation
(*c*) Cyst drainage

Clinic Discharge with skin irritation and digestion
Compl (a) **Skin digestion**
(b) Malnutrition
Treat (A) **Protective dressings:**
(1) **2% hydrochloric acid** + paraffin
(2) **Egg albumin**
(3) (a) Durofix or mastisol application
↓ (b) Suction drain
↓ (c) Horse serum gauze pack around
↓ (d) Kaolin powder
+ (B) **Carbohydrate free diet**

(VII) NEW GROWTHS OF THE PANCREAS:

(1) ADENOMA OF THE PANCREAS

Site Islet of Langerhans
Path **Hyper-insulinism**
Clinic (a) Recurrent attacks of
Dreaminess + coma
+ (b) Intermediate neurasthenia
(α) Irritability
(β) Depression
(γ) Weakness
(δ) Insomnia
Test **Intravenous 5 units of insulin:**
↓ (a) Attack of hyper insulinism
(b) Failure of blood sugar to return to normal
After two hours
Treat (1) Pre operative
High carbohydrate diet
(2) Operative
(a) Removal of pancreatic adenoma
or (b) Excision of pancreatic tissue
or (c) **Partial pancreatectomy**

(2) CARCINOMA PANCREAS

Etio Men of 40
Site Head of the pancreas
Path (a) Encephaloid
(b) Scirrhous
Microscop (1) Spheroidal acinar
(2) Columnar ductal
(3) Islets of Langerhans
Clinic (1) **Biliary type:**
(a) Progressive permanent persist obstruc.
Yellow → olive green → grey jaundice
(b) Gall bladder +
(c) Liver +

(2) **Portal type:**
Ascites

(3) **Alimentary type:**
Pyloric obstruction syndrome

(4) **General type:**
Marked cachexia

(5) **Painful type:**
Constant, deep seated, epigastric pain

Signs (a) Hard, nodular, fixed, epigastric tumour
(b) X Rays filling defects on barium meal
(c) Laboratory signs of deficient external secretion (See above)

Diff diag (1) Gall stones and cholecystitis
(2) Chronic pancreatitis
(3) Carcinoma bile duct
(4) Carcinoma pylorus
(5) Any cause of cachexia
(6) Other causes of obstructive jaundice

Treat **Internal biliary drainage:**
(A) Cholecyst (a) Gastrostomy
or (b) Duodenostomy
or (c) Jejunostomy
With loop anastomosis

or + (B) Gastro enterostomy

(VIII) IMPORTANT POINTS

(1) In acute pancreatitis an increase in the serum diastase is almost invariably present

(2) After short circuit operations for carcinoma pancreas, 90% of the patients die within a year but they are relieved of pruritus, jaundice and pain

(3) *Dusky cyanosis of the face and neck*, due to protein metabolic toxæmia *is pathognomonic of acute pancreatitis*

(4) *Fat necrosis and blood stained fluid in peritoneal cavity are pathognomonic of acute pancreatitis*

(5) *Raised diastase index, lowered sugar tolerance and early leucocytosis upto 50,000 are characteristics of acute pancreatitis*

(6) There are three stages of acute pancreatitis
(a) Œdema pain
(b) Necrosis intestinal obstruction syndrome
(c) Abscess epigastric tumour

(7) In acute pancreatitis
(a) Pain and toxæmia are most prominent

(b) Demonstration of specific ferments in serum and urine is of crucial importance

(c) Urinary diastase is the most valuable indication.

(8) In chronic pancreatitis, a high glucose content of the blood is an important piece of evidence.

(9) Indications for immediate operation in acute pancreatitis

(a) Uncertain diagnosis

(b) Progressive course

(c) Peritonitis or abscess

(d) Ileus without improvement

+ (e) Absence of circulatory failure

(10) There are two views on treatment of acute pancreatitis

(a) Immediate operation

(b) Conservation → delayed operation

(11) *Best evidence that the correct diagnosis is pancreatitis is a rise in the blood and urinary diastase*

(12) A rise in blood sugar whilst the patient is fasting is of great importance in diagnosis of acute pancreatitis.

(13) The first surgeon to remove pancreatic calculi was Capparelli in 1883, the first in England was Pearce Gould in 1891

(14) *Acute pancreatitis*

(a) *Acute abdominal catastrophe*

(α) Intolerable pain

(β) Profound collapse

(γ) Absence of rigidity

(b) *Cyanosis* of face and neck

(c) *Loewi's* mydriatic test

(d) *Urine and blood diastase*

(15) Pancreatic cyst

(a) Supra umbilical cystic swelling

(b) Transmitted pulsations.

(16) *In all cases of pancreatitis, acute or chronic*
Look for (a) *Biliary sepsis*
(b) *Biliary stones*

(17) Courvoisier's law

(A) Jaundice + large gall bladder
No stone impaction

(B) Stone impaction

(a) Fluctuating jaundice

+ (b) Impalpable gall bladder

(C) Permanent obstruction

(a) Progressive jaundice

+ (b) Enlarged gall bladder

(D) Exceptions

(a) Impaction at the three ducts junction

(b) Double impaction
(a) Cystic duct
+ (β) Hepatic or common duct
(c) Ampullary impaction

(18) Ptyalism is sometimes a prominent feature in pancreatic asthenia and carcinoma.

(19) *Simple wasting may be the only sign of chronic pancreatitis*

(20) *Special complications of pancreatic operations* :
(a) *Burst abdomen*
(b) *Skin digestion*
(c) *Pancreatic asthenia*

(21) Mishaps at the pancreatic operation
(a) Injury to superior mesenteric artery
(b) Thrombosis of splenic and mesenteric veins.

(22) *Carcinoma pancreas*
(a) *Elderly age*
(b) *Persistent progressive jaundice*
(c) *Gall bladder +*

(23) All pancreatic cysts present between stomach and transverse colon, being covered by gastro colic omentum

(24) Anastomosis of gall bladder to alimentary tract is the treatment in cases of pancreatic obstruction to the biliary ducts, malignant or non malignant

(25) Acute pancreatitis is due to infection which causes activation of trypsinogen within the substance of the gland, followed later by autolysis

(26) Main path of infection in acute pancreatitis is pancreatic duct

(27) Acute pancreatitis is due to acute retrojection of bile into pancreas due to
(a) Common termination of biliary and pancreatic ducts
+ (b) Spasm of sphincter Oddi
or (c) Impaction of gall stones in the ampulla.

(28) Presence of one or all the pancreatic ferments in the fluid from a fistula, cyst or peritoneum is an indication of its source from the pancreas

(29) *Insidious, progressive, persistent, painless jaundice with rapid emaciation and enlarged gall bladder in an elderly patient means carcinoma pancreas*

(30) Reason for Courvoisier
In biliary stones, chronic cholecystitis must have led to fibrosis of the gall bladder

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CHAPTER XII

THE SPLEEN

(I) CONGENITAL ABNORMALITIES:

(1) MOBILE SPLEEN

Def Abnormal mobility of a spleen to a varying extent
- (a) Mobile spleen
- (b) Wandering spleen

Etio
- (a) Congenital absence of phrenico colic lig
- (b) Trauma to suspensory ligaments
- (c) Splenomegaly
- (d) Visceroptosis

Clinic
- (1) Dyspepsia traction on stomach
- (2) Spleen
  - (a) Palpable in abnormal situation
  - + (b) Loss of normal splenic dullness
  - ↓ (c) Reducible to normal site

Diff diag
- (1) Kidney
  - (a) Hydronephrosis
  - (b) Polycystic kidney
- (2) Uterus
  - (a) Pregnant uterus
  - (b) Pedicled uterine fibroid
- (3) Pedicled ovarian cyst
- (4) Carcinoma stomach or colon

Compl
- (a) Torsion of the splenic pedicle
  - (α) Engorgement hypertrophy
  - (β) Atrophy
  - (γ) Strangulation
- (b) Dislocation fixation in abnormal site
- (c) Exposure to trauma
- (d) Implication of other organs in torsion

Treat
- (A) Conservative
  - Belt
- (B) Operative
  - (a) Splenopexy
  - (b) Splenectomy
    - Ind
      - (α) Torsion of the spleen
      - (β) Splenomegaly
      - (γ) Trauma to the spleen

(2) MICROSPLENIA

Small → absent spleen

(3) ACCESSORY SPLEEN
- Presence of small splenicules in
  - (a) Splenic pedicle
  - (b) Lieno renal ligament
  - (c) Gastro splenic ligament

(4) TRANSPOSITION OF SPLEEN
In association with general visceral transposition

(II) TRAUMA.

(1) RUPTURE OF THE SPLEEN

Etio (A) **Traumatic:**
- (a) Direct
  - (α) Blows or kicks
  - (β) Run overs
  - (γ) Falls on projecting objects
- (b) Indirect
  - Twists

(B) **Spontaneous:**
- (a) Normal spleen
- (b) Splenomegaly
  - (α) Malaria
  - (β) Kala azar
  - (γ) Blood diseases

Pre disp (1) **Splenomegaly**
(2) Mobile spleen

Path (a) Punctured
(b) **Fissured**
(c) **Lacerated**
(d) Torn partial avulsion
(e) Severed complete avulsion
(f) Pulped in run overs

Clinic (1) **History** of trauma
↓ (2) **Shock**
+ (3) **Local syndrome:**
- (A) Absent
- or (B) Local signs
  - (a) Pain (α) Local
    - (β) Left shoulder Kehr
  - (b) **Tenderness**
  - (c) Rigidity
  - (d) Fullness
  - (e) Dullness

+ (4) **Hæmo peritoneum:**
- (A) **Signs of internal hæmorrhage:**
  - (a) **Pallor**
  - (b) Restlessness
  - (c) Thirst
  - (d) Rising pulse and respirations

+ (B) **Signs of free fluid in peritoneum**
+ (C) ***Ballance's sign:***
  : (α) Local non shifting dullness
  + (β) Shifting dullness in perit. cavity
↓ (5) **Stage of irritative peritonitis**
↓ (6) **Stage of paralytic *ileus***

Path. types. (A) **Fulminating:**
Path (*a*) Avulsion of the spleen
↓ (*b*) Acute hæmoperitoneum
↓ (*c*) *Immediate death*

(B) **Acute:**
Path (*a*) Splenic fissure or laceration
↓ (*b*) Moderate hæmoperitoneum
↓ (*c*) *Irritative peritonitis*
↓ (*d*) Sequelæ
  (α) Paralytic ileus
  (β) Sepsis
  (γ) Adhesions

(C) **Delayed:**
Path (*a*) Sub capsular hæmorrhage
or Omental plug
or Clot seal
↓ (*b*) Latency for some days
↓ (*c*) Acute hæmoperitoneum

Clinic. types (A) **Fulminating:**
Clinic (*a*) Trauma
↓ (*b*) Profound hæmorrhagic shock
↓ (*c*) Death

(B) **Acute:** Classical acute abdomen
Clinic (*a*) Trauma
+ (*b*) Shock
+ (*c*) Local signs
+ (*d*) Hæmoperitoneum + Ballance's sign
↓ (*e*) Peritonitis

(C) **Delayed:**
Clinic (*a*) Trauma
+ (*b*) Local signs
↓ (*c*) Apparent recovery
↓ (*d*) Acute hæmoperitoneum

(D) **Spontaneous recovery:**
Clinic (*a*) Trauma
+ (*b*) Local signs
↓ (*c*) Recovery on expectant treatment

Treat **Immediate exploratory laparotomy:**
(A) **Exploration**
↓ (B) ***Splenectomy***
↓ (C) **Peritoneal toilet**

(1) Preoper (a) Antishock treatment
No intravenous saline
(b) Blood transfusion
(c) Local ice bag
(2) Anæsth (a) Local + chloroform
(b) *Local + sodium evipan*
(3) Technique
(a) Incision
Midline supra umbilical
(1) Button hole explorative
↓ (2) Enlarged if diag confirmed
↓ (3) Additional transverse
If difficult access
(b) Exploration of the spleen
(α) Digital
(β) Visual
(c) Digital compression of splenic vessels
(d) Splenectomy
Clamp the splenic pedicle
(α) Bit by bit
(β) As near the spleen as possible
(γ) Transfix every clamp
(e) Peritoneal toilet
(f) Exploration of other viscera
(1) Splenic vein
(2) Liver
(3) Pancreas
(4) Alimentary canal
(5) Kidney
(g) 2 Pints of warm saline in peritoneum
(h) Closure
(i) Blood transfusion if necessary
(α) Auto (if no injury to hollow viscera)
(β) Homo
(4) Post compl (See under Operations)

(2) STAB AND GUNSHOT WOUNDS
(A) Same as rupture spleen
+(B) Associated injury to
(a) Left pleura lung diaphragm
(b) Stomach intestines colon
(c) Left kidney

(III) SPLENOMEGALY

(A) SURGICAL SPLENECTOMY INDICATED
(I) *Blood diseases with splenomegaly*
(1) SPLENIC ANÆMIA
Syn (a) Banti s disease
(b) Hepato lienal fibrosis

Etio **Adolescent** males

Cause: Defective iron metabolism
- (a) Defective intake
- (b) Defective absorption
- (c) Increased demand

Path. (a) Primary splenomegaly
- \+ (b) Portal cirrhosis ascites
- \+ (c) Anæmia
- \+ (d) Sclerosis and thrombo phlebitis of
  - (α) Splenic vein
  - (β) Portal vein

Morb anat
- (1) Dilatation of portal vascular bed
- (2) Fibrosis + cellular decrease of spleen
- (3) Obstructive factor

Path groups
- (1) **Thrombocytopenic.** Hæmorrhages
- (2) **Thrombocythæmic:** Thrombosis

Clinic stages
- (A) **Splenomegaly + anæmia:** 5–10 years
- ↓ (B) **Enlarged liver + urobilinuria.** 6–18 months
- ↓ (C) **Portal obstruction** Ascites 2 years

Banti's syndrome
- (1) Splenomegaly
- (2) Anæmia
- (3) Leucopenia
- (4) Initial hæmorrhages
- (5) Ascites

Initial symptoms
- (1) Gradually developing weakness
- (2) Enlarging abdomen
- (3) Hæmatemesis

Compl Recurrent gastro intestinal hæmorrhages

Treat
- (1) Massive doses of iron
- (2) Blood transfusion
- (3) **Splenectomy**
  - Contraind (a) Hepatic insufficiency
  - (b) Anæmia + +
  - (c) Ascites
- (4) Palliative surgery
  - (A) Ligature of coronary vein — For hæmatemesis
  - (B) Omentopexy — For ascites

Post. Compl
- (a) Hæmorrhage thrombocytopenia
- (b) Thrombosis. thrombocythæmia

(1) Splenic vein
(2) Portal vein
(3) Mesenteric vein
(c) Peritonitis
(d) Liver failure

(2) VON JAKSCH ANÆMIA

Def Secondary anæmia with splenomegaly
Etio Infancy or childhood **3 9 years**
Rickets and debility

Clinic (1) Age 3–9 years
(2) **Splenomegaly**
(3) Liver enlargement slight
(4) **Lymph gland enlargement**
(5) Secondary anæmia

Laboratory Leukæmic picture without leucocytosis

Treat (a) Generous diet
(b) Iron arsenic vitamines
(c) Blood transfusions
(d) Splenectomy if conservatism fails

(3) ACHOLURIC FAMILIAL JAUNDICE

Def Hæmolytic disease affecting
(a) Spleen
↓ (b) Liver
+ (c) Biliary passages

Path (A) **Congenital**
Increased erythrocytic fragility
(B) **Acquired**
Splenic avidity for erythrocytes
Hypersplenism

Types (A) **Congenital**
Etio Familial and hereditary
Age Infancy or childhood
Clinic More jaundiced than ill
Prog Good
(B) **Acquired**
Age Adults
Clinic More anæmic than jaundiced
Prog Grave

Clinic (1) **Splenomegaly + + +**
(2) **Hæmolytic jaundice**
Persistent non toxic

Signs (1) **Stools normal**
(2) Urine Amber brown
Urobilin +
Bile —

(3) Blood. (a) Secondary anæmia
(b) **R.B.C. fragility +**
(c) Van den Bergh.
(α) Direct negative
(β) Indirect positive

Special. **Crises or exacerbations:**
(a) Pyrexia with toxæmia
(b) Acute anæmia
(c) Deepening of jaundice
(d) Tender, rapid splenomegaly
(e) Wasting

Compl (1) Pigment **cholelithiasis**
(2) Biliary sepsis
(a) Cholecystitis
(b) Cholangitis
(3) Cirrhosis liver

Treat (A) **Splenectomy**
(B) Exploration of biliary apparatus
(C) Treatment of cholelithiasis

(4) PURPURA HÆMORRHAGICA

Def Non traumatic frequent recurrent wide spread hæmorrhages

Path (a) **Low platelet count**
(b) **Prolonged bleeding time**
(c) **Normal clotting time**

Varieties (1) **Purpura simplex**
(2) **Purpura rheumatica**: Schonlein
(3) **Purpura abdominalis**: Henoch
(4) **Purpura fulminans**
(5) **Purpura hæmorrhagica**: Werlhof

Syn Essen thrombocytopenic purpura

Def Idiopathic hæmorrhagic disease
(a) Bleeding from
(α) Muc mem.
(β) Subcutaneous
(b) Secondary anæmia
(c) Thrombocytopenia
(d) Prolonged bleeding time

Etio **Adolescent females**

Clinic. types (A) **Acute:**
Severe, uncontrollable, dramatically sudden hæmorrhages:
(a) External
(b) Internal
(c) Extravasations

(B) **Chronic.**

Milder recurrent attacks of hæmorrhage at irregular intervals with remissions and exacerbations

Symps
- (*a*) Epistaxis
- (*b*) Hæmatemesis
- (*c*) Hæmaturia
- (*d*) Menorrhagia
- (*e*) Melæna
- (*f*) Hæmarthrosis
- (*g*) Hæmothorax
- (*h*) Hæmoperitoneum
- (*i*) Petechiæ

Diagnosis
- (1) **Low platelet count** 50000
- (2) **Tourniquet test:** Petechiæ
- (3) **Prolonged bleeding time·** 20–60 min
- (4) **Normal clotting time**
- (5) **Failure of clot retraction**

Diff diag
- (1) Hæmophilia
- (2) Toxic hæmolytic purpura
- (3) Scurvy
- (4) Aplastic anæmia
- (5) Leukæmia
- (6) Rashes (*a*) Specific
  (*b*) Infectious

Treat (A) Medical
- (1) Blood
  - (*a*) Blood transfusion
  - (*b*) Intramuscular auto blood
- (2) Radiotherapy
  - (*a*) Radium
  - (*b*) Deep X Rays
  - (*c*) Ultra Violet Rays
- (3) Protein shock therapy
  - (*a*) Antivenin
  - (*b*) Horse-serum
  - (*c*) Milk
  - (*d*) Peptone
- (4) Coagulants
  - (*a*) Coagulen-Ciba
  - (*b*) Thromboplastin
  - (*c*) Hæmoplastin
- (5) Diet
  Vit. B and C, Liver
- (6) Drugs
  - (*a*) Salvarsan
  - (*b*) Calcium + parathormone
  - (*c*) Iron and arsenic
  - (*d*) Glandular therapy

(B) **Surgical:** Excellent results
(1) **Splenectomy**
+ (2) Spleniculectomy
+ (3) Removal of septic foci

(5) SPLENIC THROMBOPHLEBITIS:
Varieties (A) **Primary:** Etiology unknown
(B) **Secondary:** To splenic anæmia
(a) Splenic anæmia: (See above)
↓ (b) Splenic or portal endophlebitis
↓ (c) Splenic or portal thrombosis
↓ (d) Splenomegaly

Treat **Splenectomy:**
Difficulties (a) Friable and tortuous veins
(b) Many adhesions

(II) *Portal cirrhotic splenomegaly*
Syndrome (A) **Liver cirrhosis**
+ (B) **Ascites**
↓ (C) **Splenomegaly**
Treat (1) **Splenectomy:** In early cases
+ (2) **Talma-Morison omentopexy:** In ascites

(III) *Protozoal splenomegaly*
(1) MALARIAL SPLENOMEGALY.
Etio Most common in tropics
Clinic (1) Malaria past or present
(2) Splenomegaly
Compl Rupture (a) Accidental
(b) Medico legal
(c) Spontaneous
Treat Splenectomy
Ind (a) Rupture
(b) Very big size
(c) Undue mobility
(d) Torsion of the pedicle

(2) EGYPTIAN SPLENOMEGALY.
Syn Bilharzial splenomegaly
Def. Splenomegaly due to bilharzia Mansoni
Clinic. Insidious onset
(a) First stage 2 weeks
Pyrexia
(b) Second stage 3 years
(α) Enlarged liver
+ (β) Enlarged spleen

(c) Third stage:
(α) Atrophic cirrhosis liver
(β) Splenomegaly
(γ) Ascites

Sign: **Eosinophilia**

Treat: (A) **Medical:**
(a) Full dose of carbon tetrachlor.
↓ (b) Full course of tartar emetic
↓ (c) Six inj of neosalvarsan

(B) **Surgical:**
Pre oper. Antipneumonia vaccine
Anæsth. Spinal
Technique. (a) Splenectomy
(b) Omentopexy if ascites

(3) GUMMA OF THE SPLEEN

(4) HYDATID OF THE SPLEEN.

Treat. (a) Splenectomy
(b) Marsupialisation

(IV) *Abscess of the spleen:*

Etio: (a) *Acute infectious fever*
(b) Pyæmia
(c) Acute infective endocarditis
(d) Tropical infections

Clinic (1) General. septic toxæmia
(2) Local. (a) Left hypochondritis
(α) Pain (1) Local
(2) Kehr
(β) Tenderness
(γ) Rigidity
(b) Local pitting œdema
(3) Regional: left basal signs

Signs: (a) Blood examination
(α) Count
(β) Widal
(γ) Culture
(b) X Rays. diaphragmatic abnormality
(c) Splenic puncture. (On operation table)
(α) Preliminary to incision
(β) 10th interspace mid axillary line

Treat: (A) *Splenectomy*
(B) Splenotomy and drainage:
Ind: (a) Difficult splenectomy
(b) Bad general condition
(c) Localising signs

(V) *New growths of the spleen:*

(1) CYSTS OF THE SPLEEN:

(a) Simple blood cyst: single
(b) Simple lymph cyst
(c) Simple serous cyst } : small, multiple
(d) Dermoid cyst
(e) Polycystic spleen:
: Association with kidney and liver
(f) Hydatid cyst
Treat. (1) Splenectomy
(2) Marsupialisation

(2) GAUCHER'S DISEASE:

Etio: Sex: females
: Age: (a) Acute: children
(b) Chronic: adults
: Congenital and familial
Path: Disturbances in lipoid metabolism with deposition of kerasin in Gaucher cells of reticulo endothelial system
Clinic (1) Insidious onset
(2) **Splenomegaly:**
(a) Large size
(b) Earliest sign
(3) Liver enlargement
(4) **Conjunctival thickening:**
: Pinguecula
(5) **Hæmachromatosis:**
: Symmetrical pigmentation of legs
(6) Bone changes:
(a) Sclerosis: (α) General
(β) Local
(b) Pathological fractures
(7) Nervous symptoms: tremors
(8) Internal secretion disturbances
Compl. (1) Cachexia
(2) Anæmia
(3) Intercurrent diseases
Diff diag: (a) Splenic anæmia
(b) Acholuric jaundice
(c) Biliary cirrhosis
(d) Von Jaksch
(e) Leukæmia
Treat: Splenectomy

(3) MISCELLANEOUS GROWTHS:

(A) Angioma: cavernous
(B) Sarcoma
(C) Fibroma
(D) Lymphoma
(E) Lymphangioma

(VI) *Aneurysm of splenic artery.*

Clinic (1) Violent, sudden, hæmoperitoneum
or (2) Aneurysm + splenomegaly
(A) Pulsating epigastric tumour
+ (B) Splenomegaly

Treat (1) Proximal ligature
↓ (2) Excision of the aneurysm sac
+ (3) Splenectomy

(B) MEDICAL SPLENOMEGALY
SPLENECTOMY CONTRA INDICATED

(I) *Circulatory splenomegaly*
(1) Splenic vein thrombosis
(2) Decompensated heart
(3) Liver cirrhosis
(4) Infarction of the spleen endocarditis

(II) *Infective splenomegaly*
(1) Typhoid
(2) Kala azar
(3) Malaria

(III) *Blood diseases splenomegaly*
(1) Pernicious anæmia
(2) Polycythæmia rubra
(3) Leukocythæmia
(*a*) Spleno medullary
(*b*) Lymphatic
(4) Hodgkin lymphadenoma

(IV) *Chronic infections splenomegaly*
(1) Tuberculosis (*a*) Miliary
(*b*) Cold abscess
(2) Syphilis
Path (*a*) Congenital diffuse splenomegaly
(*b*) Secondary *diffuse interstitial splenitis*
(*c*) Tertiary (α) Interstitial splenitis
(β) Gumma of the spleen
Diff diag Splenic anæmia
Treat *Antisyphilitic*
(3) Actinomycosis

(V) *Metabolic splenomegaly*
(1) Rickets
(2) Amyloid disease
Etio Chronic pyococcal sepsis
Path Peri vascular deposit of amylosin
Clinic (*a*) Chronic septic focus
(*b*) Splenomegaly spleen deposition
(*c*) Enlarged liver liver deposition

(*d*) Diarrhœa intestinal deposition
(*e*) Albuminuria kidney deposition

(VI) *Peri splenitis*
Associated with Pick s multiple serositis

(IV) OPERATIONS ON THE SPLEEN

(1) SPLENIC PUNCTURE

Ind Kala azar
Prep Calcium lactate 30 grs
(*a*) Night before
(*b*) Morning before
(*c*) Just after
Position Flat on back with hands under head
Site (*a*) 10th intercostal space
+ (*b*) Mid axillary line
N B Holding of breath during the puncture

(2) SPLENECTOMY

Ind (A) *Congenital anomalies of position*
(*a*) Thoracic spleen diaphragmatic hernia
(*b*) **Mobile spleen**
(α) Wandering spleen
(β) Floating spleen
(γ) Torsion of the pedicle
(B) *Trauma*
(*a*) **Rupture**
(α) Direct trauma
(1) Penetrating wound
(2) Laceration
(3) Prolapse through a wound
(β) Indirect trauma
(γ) Spontaneous rupture
(*b*) **Stab and gunshot wounds**
(C) Focus of disease
(*a*) Splenic arterial aneurysm
(*b*) Abscess
(*c*) Cysts (α) Hydatid
(β) Blood serous lymphatic
(γ) Dermoid
(*d*) New growths
(α) Innocent (1) Fibroma
(2) Lymphoma
(3) Lymphangioma
(4) Hæmangioma
(β) Malignant (1) Sarcoma
(2) Carcinoma

(*e*) Bacterial or protozoan splenomegaly:
(1) T. B.
(2) Gumma
(3) Malaria
(4) Kala-azar
(5) Egyptian or bilharzial
(*f*) Gaucher's disease

(D) *Portal back pressure :*
(*a*) **Splenic anæmia : Banti**
(*b*) **Hepatic cirrhosis**
(*c*) Thrombo-phlebitic splenomegaly
(*d*) Idiopathic splenomegaly

(E) *Hypersplenism :*
: Extensive destruction of r. b. cs
(*a*) Thrombocytopenic purpura hæmorrhag.
(*b*) Acholuric jaundice

(F) *Von Jaksch*

Contraind : (1) Very poor general condition
(2) Technical difficulties :
(*a*) Adhesions
(*b*) Friability

Pre oper : (1) Blood transfusion ·
· (Before, during, and — or after operation)
(2) Stomach aspiration with Ryle tube in situ

Tech . (1) **Incisions :**
(A) **Midline supra-umbilical :**
Ind : General exploration is easy
(B) **L shaped :**
Ind : Good access after general exploration
(C) Left paramedian ·
Ind : Diagnosis certain
(D) **Trans-rectus muscle-split :**
Ind . Easy approach
Contraind : Post operative rectus weakness
Tech : Split at junction of middle and inner third of left rectus
(E) **Left subcostal**
Ind : Obesity
(2) **Exploration of abdomen**
(3) **Mobilisation of spleen :**
(*a*) Exploration and palpation of spleen
(*b*) Ligature and division of adhesions
(*c*) Transfixion and ligature of gastro-splenic lig
(*α*) Close to the spleen
(*β*) Away from the stomach

(d) Mobilisation of the spleen:
: *If there are dense adhesions, make an incu the parietal peritoneum anterior to the adh and mobilise the spleen by separating bo layers upto the splenic pedicle*
(e) Division of post. leaf of lieno renal ligament
(f) Delivery of the spleen out of the wound

Ligature of the spleen pedicle:
(a) Strip off the pancreatic tail
(b) Pack the splenic bed
(c) Clamp the pedicle with three clamps
: Under direct vision
(d) Ligatures.
(α) Whole pedicle at most medial clamp
(β) Individual vessel ligature at middle clamp
(γ) *When the vessels are large and friable, ligate 2 or 3 vessels with a thick (No. 2) chromic catgut, and not the whole pedicle in a single ligature*

(5) **Excision of the spleen:**
(a) Remove the pack
(b) Look for hæmorrhage
(c) Omentise the pedicle

(6) **Peritoneal toilet**
(7) **Exploration of other viscera**
(8) **Closure**

Difficulties: (1) **Bad general condition:**
(a) Do not operate
(b) Anti-shock measures
(c) Delicate handling

(2) **Inaccessibility:**
Causes: (a) Rigid abdomen
(b) Badly placed incision
(c) Deep splenic fossa
Treat: (1) Good anæsthesia
(2) Extension of incision

(3) **Adhesions:**
Treat: (a) Splenic arterial control
(b) Packing
(c) Technique mentioned under mobilisation of spleen
(d) Abandonment of operation:
: After tying splenic artery

(4) **Blood accumulation:**
Causes: (a) Pre operative
(b) Slipped pedicle

Treat (1) Control the splenic artery
(2) Peritoneal toilet

(5) **Too big spleen**
Treat (1) Tie the splenic artery first
↓ (2) Squeeze the spleen and wait
↓ (3) Tie the pedicle

(6) **Friable pedicle and spleen**
Causes (*a*) Splenic thrombo-phlebitis
(*b*) Sepsis
(*c*) Delayed hæmorrhage from rupture
Treat (1) Ligature of individual vessels
(2) Ligatures not too tight or loose

(3) ADDITIONAL SURGICAL PROCEDURES

(A) Pre operative temporary ligature of splenic artery
(Med Ann 1940)
Ind (*a*) Too big spleen
(*b*) Too many adhesions
(*c*) Profuse hæmorrhage expected
Tech (*a*) Small left paramedian incision
(*b*) Retraction downwards of the stomach
(*c*) Tear through gastro hepatic ligament
(*d*) Pass a rubber tube round the arterial origin
(*e*) Splenectomy
Through the transverse incision
(*f*) Release the artery
After tying the pedicle

(B) Permanent ligature of splenic artery
Ind (*a*) Difficult splenectomy
(*b*) Splenic arterial aneurysm

(C) Radiotherapy
Ind (1) Leukæmias
Result (*a*) Temporary improvement
↓ (*b*) Recurrence
Compl (*a*) Over irradiation
↓ (*b*) Marrow failure
(2) Polycythæmia
(3) Lymphadenoma

Post compl (1) **Shock**
Ætio (*a*) Trauma
(*b*) Hæmorrhage
Path (*a*) Primary
(*b*) Delayed
Treat (1) Anti shock measures
(*a*) Pre operative
No intravenous saline if hæmor
(*b*) Operative
(α) Saline 2 pints in peritoneum
(β) Auto blood transfusion

(c) Post operative:
(α) Intravenous saline
(β) Blood transfusion

(2) **Hæmorrhage:**

(A) Operative.

Causes: (a) Slipped pedicle
(b) Friable pedicle:
· (α) Delayed ruptures
(β) Spontaneous ruptures
(c) Adhesions
(d) Abnormal bleeding time

Treat (1) Temp. ligature of splenic artery
(2) Follow and tie the slipped pedicle
(3) Individual vessel ligatures
(4) Packing

(B) Post operative

Causes. (a) Slipped ligature
(b) Sepsis
(c) Predigested ligatures
· Pancreatic ferments

Treat Re exploration

(3) **Hæmatemesis:**

Causes. (a) Thrombocytopenia
(b) Gastric congestion

Treat· (1) Conservative
↓ (2) Coronary vein ligature

(4) **Acute gastric dilatation:**

Treat Ryle tube drainage

(5) **Paralytic ileus**

(6) **Chest complications:**

(a) Diaphragm
(α) Hiccup
(β) Sub phrenic abscess
(b) Pleural effusion
Treat Repeated aspirations
(c) Lungs. pneumonia, collapse, œdema

(7) **Pancreatic trauma:**

(a) Burst abdomen
(b) Peritoneal effusion + fat necrosis

(8) **Vein thrombosis:**

Sites· (a) Splenic
(b) Portal
(c) Mesenteric
(d) Femoral

Cause (1) Thrombocythæmia
(2) Thrombo phlebitis:
: In splenic anæmia

(9) **Splenic asthenia :**
Time About 10th day
Clinic Irritability + pyrexia + emaciation
Treat Arsenic

(10) **Burst abdomen :**
Causes (*a*) Pancreatic trauma
(*b*) Debility
(*c*) Technical error
Continuous sutures for muscles
(*d*) Abnormal early strain cough
(*e*) Sepsis of the wound

(11) **Peritoneal effusion :**
Causes (1) Pancreatic trauma
(2) Peritonitis

(12) **Intestinal obstruction :**
Cause Adhesions

(13) **Liver death ·**
Hepatic insufficiency

(14) **Ventral hernia**

(V) IMPORTANT POINTS

(1) *In splenic rupture, remember*
  (*a*) *Temporary digital compression of splenic vessels immediately on opening the abdomen*
  (*b*) *No intravenous saline before the control of the source of internal hæmorrhage*
(2) Most common causes of splenic rupture
  (*a*) Fall from a height
  (*b*) Motor car accidents
(3) Spleen is the only viscus in the abdomen, which is liable to laceration due to slight external injury because of
  (*a*) Splenomegaly
  (*b*) Normal friability
(4) *A case of hæmo peritoneum seen on the 2nd or 3rd day simulates acute inflammatory peritonitis with rigidity, free fluid etc.*
(5) *Never forget to examine for pallor the conjunctivæ, tongue and nails of every patient with acute abdomen, to exclude acute hæmo peritoneum*
(6) Bluish red discoloration of the peritoneum, seen on exploratory incision, presages hæmo peritoneum
(7) Friable pedicle appears to be the peculiar terror of delayed cases of rupture spleen
(8) Splenic pedicle
  (*a*) Avoid cutting out of a ligature
  (*b*) Avoid slipped ligature.

(9) Riegues of Breslau performed the first successful splenectomy for rupture in 1893.

(10) Hollowed hands are the most efficient apparatus for removal of fragmented clot.

(11) Disadvantages of radiation of spleen:
(a) Bad effect on blood
(b) Adhesions

(12) In splenic anæmia, splenectomy does not improve the expectation of life, nor prevent the progress of the cirrhosis of liver or of the anæmia or the occurrence of hæmatemesis, and there is therefore no logical reason for performing it as a routine. (Med. Ann. 1939).

(13) In all cases of splenectomies for splenomegaly, examine splenic and portal veins for phlebitis or thrombosis before proceeding to excise the spleen

(14) *In purpura hæmorrhagica:*
(a) Coagulation time is normal
(b) Bleeding time is prolonged
(c) Low platelet count.

(15) *Hæmolytic acholuric jaundice:*
(A) Features. (a) Anæmia
(b) Acholuric jaundice
(c) Splenomegaly
(d) Blood.
(α) Reticulocytosis
(β) *R B.C. friability* +
(e) Crises
(B) Complication. cholelithiasis

(16) Splenectomy is not indicated in hæmolytic jaundice where R.B.Cs are not more fragile.

(17) *Blood transfusion is accompanied by hæmolysis in acholuric jaundice.*

(18) *Incisions for splenectomy:*
(A) *Linea alba or L: for ruptured spleen*
(B) *Left trans rectus vertical*
. For routine splenectomy
(C) *Left Kocher or subcostal.*
· In obese patients

(19) *Take care not to injure pancreatic tail in ligature of splenic pedicle.*

(20) Splenic puncture
Ind: Kala azar
Site: 10th intercostal space in mid axillary line
N.B.: Patient to hold the breath during puncture.

(21) High platelet count presages post operative venous thrombosis, low count warns about hæmorrhage.

(22) *In every spleen case, examine the blood for.*
  (*a*) General picture:
    (α) Total and differential count of leucocytes
    (β) R.B.Cs and hæmoglobin
  (*b*) Special items:
    (α) *Coagulation time*
    (β) *Bleeding time*
    (γ) *Platelet count:*
      (1) High: thrombosis
      (2) Low. hæmorrhage
    (δ) *R.B C fragility*

(23) It is better to tie the pedicle vessels individually, and as near the spleen as possible, arteries being tied before the veins.

(24) *Rupture spleen and ectopic gestation are the two most common causes of hæmo peritoneum*

(25) In stab wounds of the spleen, make a systematic search of other organs

(26) *Most common indications for splenectomy.*
  (1) *Rupture*
  (2) Blood diseases
    (*a*) Banti
    (*b*) Acholuric jaundice
    (*c*) *Purpura hæmorrhagica*
  (3) Portal cirrhosis

(27) *In every splenectomy, explore.*
  (*a*) *Liver*
  (*b*) *Biliary apparatus*
  (*c*) Pancreas

(28) In hæmo peritoneum, if spleen does not show any tear, examine the liver, if it is negative, examine the splenic pedicle, in women, do not forget ectopic gestation

(29) Common difficulties in splenectomy
  (*a*) Bad general condition
  (*b*) Inaccessibility
  (*c*) Adhesions
  (*d*) Friability

CHAPTER XIII

(I) THE PERITONEUM

(I) CONGENITAL ABNORMALITIES:

(1) ABNORMAL LENGTH OF MESENTERIES:

(A) **Short or absent mesentery:**
. Fixed or immobile viscera

(B) **Long mesentery:**
(*a*) Mobile, floating or wandering viscera
(*b*) Visceroptosis
(*c*) Volvulus

(2) ABNORMAL BANDS AND MEMBRANES.

(A) **Cystico-duodenal band:**
Gall bladder to pylorus

(B) **Mesocolic band of Pringle:**
Mesocolon to duodeno-jejunal flexure

(C) **Lane's first kink:**
4" from ileo cæcal valve to ovary

(D) **Jackson's membrane:**
Over the cæcum and ascending colon

(E) **Payr's membrane:**
Over the splenic flexure

(F) **Toldt's membrane:**
Over the pelvic colon

(3) UNOBLITERATED PROCESSES

(A) **Congenital hydrocele:**
Of the vaginal or funicular process

(B) **Congenital hernia:**
(*a*) Inguinal
(*b*) Femoral
(*c*) Umbilical

(4) ABNORMAL MOBILITY

: **Sliding hernia**

(II) TRAUMA:

(1) CONTUSIONS AND WOUNDS.

Etio. (*a*) Blows
(*b*) Falls
(*c*) Run overs
(*d*) Stab wounds
(*e*) Gunshot wounds
(*f*) Bull gores

Types. (A) **Closed:**
- (*a*) **Simple:** No visceral injury
- (*b*) **Complicated:** Visceral injury

(B) **Open:**
- (*a*) No injury + no prolapse
- (*b*) No injury + prolapse
- (*c*) Injury + no prolapse
- (*d*) Injury + prolapse

Path: (1) **Aseptic peritonitis:**
- (*a*) Contusion
- (*b*) Hæmorrhage
- (*c*) Aseptic extravasations
  - (α) Gastric contents
  - (β) Bile
  - (γ) Urine

(2) **Septic peritonitis:**
- (A) *Primary.*
  - (*a*) From within:
    Perforations, ruptures
  - (*b*) From without
    Stab wounds, bull gores
- (B) *Secondary*
  Superimposed on aseptic peritonitis

Clinic (1) **History**

(2) **Traumatic shock:**
- (*a*) Mental
- (*b*) Peritoneal
- (*c*) Hæmorrhagic
- (*d*) Splanchnic

(3) **Local examination:**
- (A) Open wound without or with prolapse
  Do not probe
  Always explore
- (B) Contusion
  Tenderness + rigidity

(4) **Traumatic peritonitis:**
- (A) Hæmorrhagic
- (B) Perforative

Compl. (1) **Shock:** Ordinary or splanchnic

(2) **Internal hæmorrhage:**
Hæmo peritoneum

(3) **Visceral injuries:**
- (*a*) Lacerations
- (*b*) Perforations
- (*c*) Ruptures
- (*d*) Prolapse

(4) **Peritonitis:**
  (a) Contusional
  (b) Extravasational
  (c) Perforative
(5) **Paralytic ileus**

Sequelæ: (1) Sepsis: (a) Wound
  (b) Abdominal wall
  (c) Peritoneal cavity:
    (α) Local
    (β) General
(2) Adhesions → intestinal obstruction
(3) Fistulæ
(4) Ventral hernia

Treat: (See further)

(2) INTRA-PERITONEAL HÆMORRHAGE:

Syn: Hæmo-peritoneum

Etio: (A) **Trauma:** To solid vascular organs
  (a) Accidental
  (b) Post operative
(B) **Vascular erosions:**
  (a) Ruptured ectopic gestation
  (b) Ruptured aneurysm

Path. (1) Sources: (a) **Spleen**
  (b) Liver
  (c) **Ectopic gestation**
  (d) Vessels
↓ (2) Irritative peritonitis

Clinic: (A) **Stage of shock:**
  (a) Traumatic shock
  (b) Local tenderness and spasm
↓ (B) **Stage of hæmorrhage:**
  (a) General signs of hæmorrhage.
    (α) **Pallor**
    (β) Rising pulse and resp
    (γ) Thirst
  (b) **Fluid in the peritoneum:**
    (α) Shifting dullness
    (β) Thrill
  (c) Local tenderness and spasm
↓ (C) **Stage of irritative peritonitis:**
  (a) General signs of hæmorrhage
  \+ (b) Acute diffuse peritonitis

Diff. diag: (1) Acute respiratory crisis
(2) Acute abdominal crisis
(3) Acute shock

Compl. (1) **Acute diffuse peritonitis:**
(a) Aseptic
↓ (b) Septic
(2) **Sepsis:**
(a) Local abscesses
(b) Septic peritonitis
(3) **Adhesions** → Intestinal obstruction
(4) Hæmorrhagic cyst

Treat (A) **Immediate exploration**
↓ (B) Treatment of the source
↓ (C) Peritoneal toilet
↓ (D) Closure without or with drainage

(3) RETRO-PERITONEAL HÆMORRHAGE:

Etio (1) Trauma to kidney
(2) Fracture pelvis
(3) *Contusions of the posterior abd wall*
(4) Trauma to the mesentery

Clinic (A) Local swelling
(B) Contusion

Compl (1) Splanchnic shock
(2) Paralytic ileus
(3) Abscess
(4) Retro peritoneal cellulitis

(4) PERITONEAL EXTRAVASATIONS:

Etio · (1) Injuries to the viscera
(a) Solid
(b) Hollow
(2) Injuries to the blood vessels
(3) Traumatic inflammation

Path *Nature of extravasation*
(1) **Serous:** Irritative peritonitis
(2) **Purulent:** Septic peritonitis
(3) **Bile-stained:**
(a) Trauma to biliary passages
(b) *Trauma to duodenum*
(4) **Intestinal:** Fæculent or fæcal
(a) *Enteric trauma*
(b) Colonic trauma
(5) **Blood-stained or hæmorrhagic:**
(a) Trauma to solid vascular organs
(b) Trauma to vessels
(6) **Urinary:**
: Intra peritoneal rupture of the bladder

Clinic (1) History of injury
(2) *Peritoneal shock*

(3) Free fluid in the peritoneum
(4) Acute spreading peritonitis
(5) Special features
  (a) Bile peritoneum
    (α) Bradycardia
    (β) Icterus
  (b) Hæmo peritoneum
    General signs of hæmorrhage
  (c) Urine peritoneum
    Urinary difficulties

Compl (1) Sepsis
  (2) Adhesions

Treat (1) Exploration
↓ (2) Treatment of the source
↓ (3) Peritoneal toilet
↓ (4) Drainage (a) Late cases
  (b) Sepsis

Treatment of abdominal trauma

(1) Anti shock measures
(2) Careful examination
  (A) External injury
    Always explore immediately
  (B) Internal injury
    (a) Suspected hæmo peritoneum
      Explore immediately
    (b) Suspected rupture or perforation
      Explore immediately
    (c) Suspected contusion only
      (α) Expectant
      ↓ (β) Operative if progressive signs
(3) Some points
  (a) Catheterise to eliminate bladder trauma
  (b) Examine (α) Chest
    (β) Spine
    (γ) Skull
    (δ) Limbs
  (c) **Better to explore than to be in doubt**
(4) **Exploratory laparotomy**
  (A) *Immediate*
  Ind (a) Open wounds
      With or without prolapse
    (b) Gunshot wound
    (c) Suspected hæmo peritoneum
    (d) Suspected visceral rupture
  (B) *Delayed*
    (a) Contusion with local rigidity
    + (b) Progressive signs
      In spite of 2 hours expectant treat

Pre oper : (1) Anti-shock measures :
: Except venoclysis in hæmo perit.
(2) Anti hæmorrhagic measures
(3) Blood transfusion

Tech : (1) Small, midline supra-umbilical incision
↓ (2) Diagnosis of the condition·
(A) If nothing abnormal : close
(B) If abnormal . enlarge the incision
↓ (3) Exploration :
(A) *Hæmo-peritoneum :*
(*a*) Spleen · with its pedicle
(*b*) Liver
(*c*) Kidneys
(*d*) Mesentery
(*e*) Big vessels
(B) *Gas or alimentary contents*
(*a*) Stomach
(*b*) Transverse colon
(*c*) Small intestines
(*d*) Duodenum
(*e*) Other parts of the colon
(C) *Bile stained fluid*
(*a*) *Gall bladder*
(*b*) Biliary ducts
(*c*) Duodenum
(D) *Urine*
: Urinary bladder
(E) *Mesenteric or omental tears*
↓ (4) Treatment of primary focus
(A) *Spleen or splenic vein .*
(*a*) Manual control of the splenic pedicle
↓ (*b*) Ligature of splenic pedicle
↓ (*c*) Splenectomy
(B) *Liver :*
(*a*) Hogarth Pringle's method
↓ (*b*) Treatment·
(α) Packing . (1) Turpentine
(2) Snake venom
(β) Suture
(C) *Pancreas :*
Diag (α) Blood-stained exudate
(β) Fat necrosis
Tech · (*a*) Infra gastric approach
(*b*) Lesser bursa toilet
(*c*) Treatment : (α) Suture
+ (β) Lesser sac drain
Compl : Burst abdomen
(D) *Biliary apparatus .*
Diag : Bile-stained fluid

Tech (*a*) Gall bladder
(α) Cholecystostomy
(β) Cholecystectomy
(*b*) Bile ducts
Clinic (α) Gradual ascitis
(β) Jaundice
Tech (1) Drainage
or (2) End to-end anastomosis
or (3) Ligature both ends
↓ Cholecyst-gastrostomy
(E) *Stomach*
Diag Gastric contents
Tech Suture
(F) *Intestines* Rupture
Diag (*a*) Local tenderness and spasm
(*b*) Position and direction of the wound
Tech (*a*) *Explore* (α) Duodenum
(β) *Duodeno-jejunal flexure*
(γ) Jejunum
(∝) Ileum
(δ) Colon
↓ (*b*) *Treatment*
(1) Duodenum
(α) Extra peritoneal drain
(β) Intra peritoneal
(1) Suture
↓ (2) Gastro jejunostomy
↓ (3) Morison drainage
(γ) Complete
(1) Close both ends
↓ (2) Post. gastro-jejunostomy
↓ (3) Morison drain
(2) Duodeno jejunal flexure
(α) Close the duodenal end
(β) Implant the jejunal end
Into third part of duodenum
(3) Small Intestines
(α) Small punctures
Purse-string
or (β) Large punctures
Double layer suture
In the transverse axis
+ (γ) Omental patch
(4) Large Intestines
(α) Intra-peritoneal
(1) Suture
+ (2) Omental graft
+ (3) Drain
(β) Extra-peritoneal
Diag Emphysema of the flank

Compl Retroperitonitis
Treat (1) Colostomy
(2) Free local drain
↓ (c) *Explore other portions of the gut*
(G) *Mesentery*
(1) Laceration
Treat (a) Longitudinal tears
Suture
(b) Parallel or transverse tears
(α) Small suture
(β) More than 2" or non-viable intest.
Resection of the intestine
Tech Ligatures over hæmostats on oppo margins
(2) Haematoma
Treat (a) Aspiration
or (b) Incision → evacuation → l gate source
or (c) Resection of the intestine
Compl (1) Paralytic ileus
(2) Gangrene gut
↓ (5) Peritoneal toilet Dry mopping
↓ (6) Drainage In
(a) Frankly septic cases
(b) Potential sepsis
(c) Irritating extravasations

***Treatment** of penetrating wounds of the abdomen*
Immediate exploratory laparotomy
Contraind (1) Shock B P under 80
(2) Favourable progress after 36 hours
(3) Sports shot gun wounds
Tech (1) Large incision
Include and excise the wound
↓ (2) Open the peritoneum
Fresh knife
↓ (3) Explore Both surfaces
(A) *Stomach and duodenum*
(a) Suture
or (b) Resection
or (c) Partial gastrectomy
(B) *Small intestines*
(a) Explore the whole length
Segment by segment
↓ (b) Treat the rents
(α) Purse-string
or (β) Transverse sutures
or (γ) Resection gut
Ind (1) Multiple perforations
(2) Suspicious viability
(C) *Mesentery*
(a) Hæmatoma
(1) Aspirate

or (2) Evacuate and tie the source
or (3) Resection gut
(β) *Tears*
(1) Close
or (2) Resection gut
(D) *Colon*
Compl Retro peritoneal cellulitis
Diag (1) Retroperitoneal juxta colic hæmatoma
(2) Emphysema of the flank
Tech (a) Retro peritoneal approach
↓ (b) Double row suture
↓ (c) Proximal colostomy
↓ (d) Retro peritoneal drainage
(E) *Spleen and pancreas*
(See above)
(F) *Liver*
(a) Excise the wound of entrance
(b) Explore the viscera
Midline incision
(c) Access to liver
Trans pleural route
↓ (4) Closure of the abdomen

Treatment of abdomino thoracic injuries
(A) Thoracic route
(a) Incision along one of the lower ribs
includes the wound
↓ (b) Removal of fractured ribs
↓ (c) Exposure of pleural cavity
Separate instruments
↓ (d) *Treatment of thoracic trauma*
↓ (e) Enlargement of diaphragmatic wound upto 6"
↓ (f) Treatment of abdominal trauma
↓ (g) Closure of the diaphragm
↓ (h) Suture of the lung to the diaphragm
↓ (i) Closure of the chest without drainage
(B) Abdominal route
Ind (1) Abdominal signs
(2) Thoracic wound small
Tech (1) Exploratory laparotomy
↓ (2) Treatment of abdominal focus
↓ (3) Attention to thorax

Treatment of shot gun wounds
(1) Masterly inactivity
(a) Fowler s position
(b) Absolute starvation for 5 days
(c) Continuous intravenous glucose-saline
(d) Intramuscular
(α) Anti-gas-gangrene serum
(β) Anti tetanus serum

(*e*) Large doses of morphia
(*f*) Observation chart
↓ (2) Exploration:
Ind. (*a*) Failure of conservatism
(*b*) Shot-gun at close range

(III) INFLAMMATIONS OF THE PERITONEUM:

Etio. types: (1) *Infective or septic:*
Sources: (A) **Alimentary tract:**
Path: (*a*) Ruptures and perforations
(*b*) Transmigration
Bact. (1) Streptococcus
(2) B. coli
(3) Anærobic bacilli
(B) **Biliary tract:**
Path. Ruptures and wounds
Bact: B coli
(C) **Fallopian tubes:**
Path. (*a*) Salpingitis
↓ (*b*) Pelvic abscess
↓ (*c*) Peritonitis
Bact (*a*) Gonococcus
(*b*) Streptococcus
(D) **Hæmatogenous:**
Path. Septicæmia
Bact: (*a*) Streptococcus
(*b*) Pneumococcus
(E) **Penetrating wounds:**
Path: (*a*) Infection carried from outside in
(*b*) Prolapse → infection
Bact Pyococci

(2) *Irritative or aseptic:*
Sources. (A) **Hæmoperitoneum:**
Etio (*a*) Traumatic. spleen or liver
(*b*) Ectopic gestation
(c) Ruptured aneurysm
Clinic. (1) General signs of **internal hæmorr.**
+ (2) Fluid in the peritoneum
(B) **Gastric juice:**
Etio. (*a*) Gastric trauma
(*b*) Gastric perforation
Clinic: Perforative peritonitis
(C) **Sterile bile:**
Etio: (*a*) Rupture or perforation.
(α) Biliary apparatus
(β) Duodenum

(b) Transudation of bile:
Cause: (α) Regurgitant pancreas ferments
↓ (β) Permeable gall bladder wall
Clinic: (a) Right hypochondritis
↓ (b) Irritative peritonitis
+ (c) **Bradycardia**
+ (d) **Icterus**

(D) **Pancreatic juice:**
Etio: (1) Pancreatic trauma
(2) Acute pancreatitis
Path: (a) Fat necrosis
(b) Blood stained fluid
Clinic: (1) Acute peritonitis: epigastric
↓ general
With: (α) Acute pain
(b) Acute shock
(c) **Cyanosis of the face**
(d) **Loewi's mydriasis**
↓ (2) Epigastric tumour. pseudocyst

(E) **Sterile urine:**
Etio: Rupture bladder
Clinic: (a) Irritative peritonitis
. Pelvic → general
(b) History of fracture pelvis
(c) Absent micturition
+ (d) Non distended bladder

(F) **Ruptured cyst:**
(a) Ovarian
(b) Mesenteric
(c) Pancreatic
(d) Hydatid

Pathology. Peritoneal irritation without infection
Compl: (1) Adhesions
(2) Infective peritonitis

(A) ACUTE PERITONITIS:

Bacteriology: of peritonitis in general:
(1) **B. coli communis**
(2) **Streptococcus; staphylococcus**
(3) **B. Tuberculosis**
(4) Pneumococcus
(5) Gonococcus
(6) Anærobic bacilli
(7) B Pyocyaneus

Etio: of acute peritonitis:
(1) *Secondary spreading peritonitis:*
Syn: Focal peritonitis
Def: Perit. spreading from an obvious local focus

or (4) Deep tenderness and rigidity:
In regions away from operative area
(5) **Paralytic ileus**
(6) Profound **toxic shock**

(4) *Traumatic spreading peritonitis:*
. (See under Trauma)

Pathology: of acute spreading peritonitis.

(1) **Exudation:**
(a) Serous or sero fibrinous
(b) Sero purulent
(c) Purulent
(d) Blood stained

(2) **Adhesions:**
(a) Fibrinous
(b) Fibrous

(3) **Inflammatory œdema**
(4) **Thrombosis of vessels**
(5) **Abscesses**
(6) **Retro-peritonitis**
(7) **Paralytic ileus**
(8) **Failure of splanchnic circulation:**
· Peritoneal shock
(9) **Portal congestion**
(10) **Peritoneal toxæmia:**
(a) B Welchii
(b) Toxic proteoses and amino acids
(11) Presence of gas (a) Perforations
(b) Mixed infections

Course. (A) Fulminating
(B) Acute spreading
(C) Acute localised

Clinic. features of acute peritonitis

Varieties (A) **Localised: Focal**
Confined to a region of primary focus.
(a) Appendicitis
(b) Salpingitis

(B) **Localised → spreading:**
(a) Localised signs
↓ (b) Progressive extension of area
(α) Direct extension
(β) Gravity
(γ) Venous or lymph channels
(δ) Rupture of protective wall

(C) **Generalised:**
: [illegible] generalised from the first.
[illegible]
[illegible]

(D) **Post operative:**
- (a) Absence of pain, tenderness and rigidity
- (b) Profound toxæmia and paralytic ileus

Stages: (1) **Initial stage of peritonism:** First 2 hours
- (a) Pain
- (b) Shock
- (c) Vomiting
- (d) Rigidity of abdomen

↓ (2) **Latent stage of illusion:** 2–6 hours
- (a) Pulse nearly normal
- (b) Rigidity absent

↓ (3) **Stage of inflammation:** 6 hours to 2–3 days
- (a) Pain + tenderness + **rigidity**
- (b) Rising pulse and temperature
- (c) Peritonitic vomiting

↓ (4) **Stage of paralytic ileus:**
- (a) Acute intestinal paralysis:
  - (α) Distension
  - (β) Absolute constipation
  - (γ) Regurgitant vomiting
- (b) Rising pulse

↓ (5) **Stage of toxic shock:**
- (a) Acute paralytic ileus
- (b) **Subnormal temperature**
- (c) **Rising thready pulse**
- (d) Facies hippocratica + cyanosis

Symptoms and signs.

(1) *Pain*:
- (a) **Visceral pain:**
  - (α) Colicky
  - (β) Round about umbilicus
- ↓ (b) **Local pain:**
  Due to regional parietal peritonitis
- ↓ (c) **Diffuse pain:**
  All over the abdomen
  Due to diffuse peritoneal irritation
- + (d) **Referred pain:**
  - (α) Right shoulder in cholecystitis
  - (β) Kehr's sign in spleen
- (e) **Disappearance of pain:**
  - (α) Sudden perforation
  - (β) Gradual. toxæmia

(2) *Vomiting*:
- (a) **Peritonism:**
  Initial, unrepeated

↓ (b) **Peritonitis:**
Small, repeated, greenish
↓ (c) **Paralytic stomach or ileus:**
Regurgitant, copious, repeated

(3) *Shock*

(a) **Initial:**
Due to peritoneal irritation
↓ (b) **Absent:**
(α) Period of illusion
(β) Period of inflammatory peritonitis
↓ (c) **Toxic:**
(α) Period of paralytic ileus
(β) Peritoneal toxæmia

(4) *Pulse*

(a) Peritonism **Normal or slow**
↓ (b) Period of illusion *Normal*
↓ (c) Inflammatory peritonitis
Rising but full and steady
↓ (d) Ileus stage
Running, thready
↓ (e) Toxic stage
Imperceptible

(5) *Temperature*

(a) Peritonism **Subnormal**
↓ (b) Period of illusion **Normal**
↓ (c) Inflammatory peritonitis **Hypernormal**
↓ (d) Ileus stage }
↓ (e) Toxic stage } **Subnormal**

(6) *Dehydration*

(a) Appears with inflammatory stage
↓ (b) Worse in ileus stage
↓ (c) Profound in toxic stage

(7) *Toxæmia*

(a) Appears with inflam stage sthenic
↓ (b) Worse in ileus stage
↓ (c) Profound in toxic stage asthenic

(8) *Hiccup*

Diaphragmatic irritation
(α) Upper abdominitis
(β) Ileus stage
(γ) Toxæmia
(δ) Basal thoracic lesions

(9) *Abdominal wall.*

(A) *Inspection.*

(*a*) Inflammatory stage:
Retraction + Immobility

(*b*) Paralytic stage.
. **Distension**

(B) *Palpation*

(*a*) **Tenderness:**

Varieties: (α) Local
(β) Rebound
(Υ) Pain in affected organ
By. Pressure on uninvolved part
(1) Present in:
(α) **Initial stage**
(β) **Illusional stage**
(Υ) Inflammatory stage
(2) Absent in
(α) Intestinal obstruction
(β) Toxic stage
(Υ) **Post-oper peritonitis**

(*b*) **Rigidity:**
(α) ***Marked in perforative perit.***
(β) **Absent in:**
(1) ***Period of illusion***
(2) **Paralytic ileus**
(3) ***Toxic stage***
(4) **Post-oper. peritonitis**
(5) *Visceral obstructions*
(6) Acute pancreatitis
(7) **Pelvic peritonitis**

(*c*) **Distension:**
Paralytic ileus
(α) Local
(β) General

(*d*) **Mass or tumour:**
(*a*) Inflammatory œdema
(*b*) Hypertrophy
(*c*) Abscess
(*d*) Local distension

(C) *Thrill*:
(*a*) Peritoneal fluid
(*b*) Large cyst hydatid

(D) *Percussion*
(*a*) Fluid shifting dullness
(*b*) Paralytic ileus tympanitis
(*c*) Perforations
. Obliteration of liver dullness
(*d*) Abscesses local dullness

(E) *Auscultation :*

(a) Borborygmi.

. Mechanical int. obstruction

(b) Dead silence : paralytic ileus

(10) *Rectal examination :*

(1) **Tenderness :**

(a) Right appendicitis

(b) Left salpingitis

(c) Anterior Douglas pouch

(d) Posterior

(2) **Mass or bogginess :** Peri rectal inflam

(3) **Palpable viscera**

(4) **Ballooning :** Low colonic obstruction

(5) **Mucus, blood or pus :**

Pelvic abscess proctitis

(11) *Special examinations ·*

(A) **Blood :** Leucocytosis

Cultures

(B) **Peritoneal paracentesis**

(C) **Exploratory laparotomy**

Differential diagnosis of acute peritonitis .

(A) **Referred acute abdomen :**

(1) **Heart :** Angina

(2) **Chest** Basal troubles

(3) **Spine :** Pott's disease

(4) **Scrotum :** Torsion testis

(B) **Medical acute abdomen :**

(1) Abdominal influenza

(2) **Typhoid tympanitis**

(3) Ascites

(4) **Uræmic ileus**

(5) Tabetic crises

(6) Henoch s purpura abdominalis

(7) **Various colics :**

(a) Intestinal

(b) Biliary

(c) Urinary

(d) Uterine

(8) Pick's disease multiple serositis

(C) **Retro-peritoneal inflammations :**

(1) Kidney and ureter

(2) External iliac lymphadenitis

(3) Retro peritoneal cellulitis

Differential diagnosis of causes of acute peritonitis :

(1) **Traumatic peritonitis :**

(a) Ruptures
(b) Stabs
(c) Prolapses

(2) **Irritative peritonitis:**
(a) Gastric juice
(b) Bile
(c) Pancreatic ferments
(d) Urine
(e) Blood

(3) **Inflammatory peritonitis:**
(a) Acute appendicitis
(b) Acute cholecystitis
(c) Acute salpingitis
(d) Acute pancreatitis
(e) Meckel's diverticulitis

(4) **Perforative peritonitis:**
(a) Gastric perforation
(b) Duodenal perforation
(c) Typhoid perforation
(d) Appendicular perforation
(e) Gangrenous perforation: (strangulation)

(5) **Obstructive peritonitis:**
(a) Strangulated hernia
(b) Bands
(c) Volvulus
(d) Acute intussusception
(e) Ileus verminosus
(f) Paralytic ileus

(6) **Primary peritonitis:**
(a) Streptococcal
(b) Pneumococcal
(c) Gonococcal
(d) Tuberculous
(e) Anærobic

Complications of acute peritonitis

(1) **Pulmonary:** (a) Pleurisy → empyema
(b) Pneumonia

(2) **Peritoneal toxæmia**

(3) **Intestinal obstruction:**
(a) Acute. (α) Immediate paralytic ileus
(β) Superimposed on chronic
(b) Chronic. due to adhesions and bands

(4) **Fæcal fistulæ:**
(a) Trauma to alimentary viscera

(b) Ulceration or erosion of alimentary vis
(α) Tuberculous
(β) Carcinomatous
(γ) Drainage tube pressure

(5) **Residual abscesses:**
(a) Subphrenic
(b) Iliac
(c) Pelvic

(6) **Pylephlebitis and portal pyæmia**

(7) **Parotitis**

Treatment of acute peritonitis

(A) *Observo conservative treatment*

Ind (a) **Localised stationary peritonitis:**
In pre operative time

(b) **Localising peritoneal abscess:**
Till firmly isolated

(c) **Diffuse grave peritonitis:**
Till patient rallies

(d) **Post-operative period**

Tech (1) *Ochsner Sherren treatment:*

(a) High or low **Fowler's position:**
Advant (α) Better respirations
(β) Pelvic accumulations
(γ) Better micturition
(δ) Abdominal relaxation

(b) **Oral attention:**
(α) No food or fluids or purges
(β) **Gargles and sialagogues**
(γ) Gastric suction drain

(c) **Rectal:**
(α) **No large enema**
(β) Rectal tap water or saline.
Continuous Murphy's drip

(d) **Intravenous:**
(α) Saline *isotonic* or hypertonic
(β) Glucose
(γ) Chemo therapy
Soluseptasine, iodine etc.
(δ) Blood transfusion

(e) **Intramuscular:** Sera
(α) Anti gas gangrene 10 c.cs
Once a day for five days
(β) Streptococcal
(γ) Pneumococcal
(δ) B coli

(f) **Subcutaneous:**

(α) **Morphia:**

Ind (1) In grave diffuse perit.
(2) Pre operative
(3) Post operative

Contraind (a) Doubtful diagnosis
(b) Doubtful treatment
(c) Children and seniles
(d) Chest complications
(e) Advanced pregnancy

(β) **Cardiac stimulants:**
Camphor in oil, cardiozol

(2) *Observation chart.* (Hourly)

(a) **Pulse:**

(α) Rate slow → normal
↓ rising → running

(β) Volume
Good → thready → bad

(b) **Temperature:**

(α) Rise
(β) Fall gradual or sudden
(γ) **Relation to the pulse:**
Prognosis bad if indirect variation

(c) **Respiration:**

(α) Rate rising
(β) Accompaniments cough
(γ) Relation to pulse and temp

(d) **Pain:**

(α) Gradual abatement
(β) Continuance
(γ) Worsening
(δ) Sudden disappearance
? *perforation*
(ε) Change in character
(a) Colicky
↓ (b) Stabbing
↓ (c) Continuous

(e) **Vomiting:**

(α) Continuance
(β) New appearance
(γ) Change in character.
(1) Small mouthfuls
(2) Regurgitant, copious
(3) *Stercoraceous*

(*f*) **Hyperæsthesia:**
: In Sherren's triangle
(α) Presence on admission
(β) Continuance
(γ) Disappearance:
(1) Gradual
(2) Sudden

(*g*) **Tenderness:** Degree & extent
(*a*) Abating
(*b*) Stationary
(*c*) Increasing

(*h*) **Rigidity:** Extent
(α) Abating
(β) Stationary
(γ) Extending
(δ) Giving place to distension
(ε) Sudden extensive appearance
? Perforation

(*i*) **Distension:** Extent
(α) Local
(β) Extending
(γ) Decreasing

(*j*) **Stools:**
(α) Absolute constipation
(β) Diarrhœa
(γ) Passage of mucus

(*k*) **Dehydration + toxæmia:**
(α) Facies Hippocratica
(β) Toxic shock
(1) Cyanosis
(2) Circulatory failure
(3) Mental asthenia

(*l*) **Blood:** Total & different. count
. Steadily increasing leucocytosis

(*m*) **Signs of complications:**
(1) **Pulmonary:**
(α) Respirations
(β) Temperature
(2) **Residual abscesses:**
(α) Localising signs
(β) Temperature
(3) **Portal pyæmia:**
(α) Rigors + fever + sweats
(β) Tender large liver
(γ) Jaundice
(4) **Parotitis:**
(α) Local signs
(β) Temperature

(B) *Surgical treatment :*

Ind : (1) Early cases of localised perit. focus :
: **Within 48 hours** of onset
(2) Failure of observ o conservative treat.
(3) Localised abscess
(4) Diffuse peritonitis :
(*a*) After disappearance of shock
(*b*) After localisation
(5) **Intestinal strangulations**
(6) **Alimentary perforations**
(7) **Hæmo-peritoneum :** Progressive

Pre oper (*a*) **Intravenous glucose-saline :**
Unless (α) Hæmo peritoneum
(β) Respiratory compl
(γ) Cardiac complications
(*b*) Sedative
Morphia ; scopolamine, omnopon
(c) Stomach tube with siphon drain
Ind (α) Obstructive abdomen
(β) Acute gastric dilatation
(γ) Prominent vomiting
(*d*) Passage of a catheter
(*e*) Preparation of the abdomen
(α) Clavicles to mid thighs
(β) Lumbar spine . for spinal
(*f*) Blood transfusion if necessary

Anæsth . (1) Spinal
(2) Local with light general
(3) General

Technique **Exploratory laparotomy :**

Incision (1) Right paramedian para-umbilical
If no pre operative diagnosis
(2) Local

Procedures (A) *Condition desperate .*
: **Blind suprapubic drain :**
Ind (*a*) Desperate diffuse peritonitis :
Due to perforated appendix
(*b*) Pelvic abscess
Anæsth : Local novocain
Tech (1) Small suprapubic incision
(2) Peritoneal opening by finger
(3) Drainage tube on hæmostat
(B) *Condition bad*
: (1) **Blind cæco or enterostomy**
\+ (2) **Suprapubic drainage**

(C) *Condition fair*
- (1) **Treatment of local focus**
- ↓ (2) **Peritoneal toilet:**
  - (a) Siphon aspiration
  - (b) Delicate sponging
- ↓ (3) **Peritoneal drainage**·
  - Ind (a) **Local focus:**
    - (α) Existing
    - (β) Potential
    - (γ) Incomplet removed
    - (δ) Not removed
  - (b) **Localised abscess**
  - (c) **Purulent exudate**
  - (d) Time more than 12 hours
  - (e) **Perforations**
  - (f) **Strangulations**
  - (g) Potential hæmorrhage
  - (h) Potential leaking
    - (α) Bile
    - (β) Intestinal contents
    - (γ) Urine
  - Sites (1) **Upto the focus**
  - (2) **Supra pubic**
  - (3) Paracolic gutters
  - (4) Morison's pouch
  - (5) Inter parietal
  - Tech (1) Not too soft or hard
  - (2) Not too narrow or wide
  - (3) Bevelled end
  - (4) Lateral hole not too big
  - (5) Straight course out
  - (6) Not to press against
    - (a) Primary focus
    - (b) Intestines
    - (c) Anastomosis
    - (d) Vessels

Procedures for different etiologies

(A) *Pneumococcal peritonitis*
- (1) Conservative
  - (a) High Fowler
  - (b) M & B 693
  - (c) Intravenous glucose-saline
  - (d) Drip blood transfusion
  - (e) Anti-pneumococcal serum
- (2) Surgical
  - (a) Diagnosis uncertain
    - (α) Gridiron appendix exploration
    - ↓ (β) Suprapubic stab drain

(b) Diagnosis established
Drainage (α) Suprapubic
(β) Vaginal

(B) *Post parturition or abortion peritonitis*
(1) Pelvic
(a) *Ochsner Sherren*
↓ (b) Posterior colpotomy drainage
(2) General
Tech (a) Right paramedian subumbilical incision
↓ (b) Isolation of pelvis
↓ (c) Opening of abscess
↓ (d) Drainage
(α) Abscess
(β) Peritoneal cavity
(1) In front of uterus
(2) Douglas

Post treat Sulphonamides

(C) *Streptococcal peritonitis*
(a) Suprapubic drainage
(b) Continuous intravenous infusion
(c) Anti-streptococcal serum
(d) Sulphonamides

(D) *Gonococcal Peritonitis*
(1) In a child
(a) Diagnosis certain
Conservative
(b) Diagnosis uncertain
(α) Laparotomy
↓ (β) Exploration
↓ (γ) Evacuation + drainage
(2) In adult females Pelvic → diffuse
Conservative
(a) Serum therapy
(b) Blood transfusions
(c) Intravenous olive oil emulsion
(d) Sulphonamides

(F) *Acute tuberculous peritonitis*
(1) Exploratory laparotomy
↓ (2) Evacuation of fluid or peritoneal toilet
↓ (3) Treatment of local focus if any
↓ (4) Closure without drainage

(F) *Post-operative peritonitis*
(a) Treat the toxæmia
(1) Intramuscular anti gas-gangrene
(2) Intravenous saline
(b) Treat the paralytic ileus
(See under Intestines)
(c) Re-open the abdomen
(1) Treat the cause

+ (2) Cæcostomy
+ (3) Supra pub c drain

(G) *Post tra imatic peritonitis*
(See under Trauma above)

(H) *Focal peritonitis*
(See under different organs)

After treatment of surgical interference for acute peritonitis

(A) **Prevention and treat of paralytic ileus**

(a) *First 24 hours*
(1) **Gastric suction drain**
(2) **Morphia** Small repeated doses
(3) **Heat** to the abdomen
(4) Avoidance of oral and rectal food
(5) **Intravenous glucose saline**

(b) *Between 24 and 48 hours*
(1) **Morphia** 1/6 gr six hourly
(2) **Acetyl choline** 0 1 gm hourly
↓ (3) Ox bile → turpentine enema

(c) *End of 48 hours*
(1) **Intravenous hypertonic saline**
500 c cs of 10% saline
↓ (2) Enema
↓ (3) **Spinal** anæsthesia
↓ (4) **Enterostomy** under local

(B) **Treatment of peritoneal toxæmia**
(1) Fowler s position
(2) Fluids
(a) Subcutaneous
(b) Intravenous
(3) Blood transfusion
(4) **Intravenous 10% olive oil emulsion**
(5) Chemotherapy intravenous
(a) **Soluseptasine**
(b) Iodine
(c) Mercurochrome
(6) Sera
(a) Anti gas gangrene
10 c cs intramuscular for 5 days
(b) Anti streptococcal
(c) Anti pneumococcal
(d) B coli antiserum
(7) Bacteriophage
30–60 c cs through drainage tube

(C) **Mouth and chest hygiene**
(1) Mouth
Gargles and sialagogues

(2) Chest:
: Anti pneumonic preventive treat.

(D) **Drainage tube:**
(1) *Removal.*
(a) Prophylactic remove in 48 hours
(b) Focal drain: 3–5 days
(c) If discharge as soon as it is less
(2) *Treatment during retention*
(a) Daily rotation
(b) Shorten gradually
(3) *Complications*
(a) **Paralytic ileus** · Local
(b) **Fæcal fistula**
(c) **Adhesions**
(d) **Strangulation**
(e) **Ventral hernia**
(f) Secondary hæmorrhage

(B) PERITONEAL ABSCESSES

Def. (1) **Secondary abscess:**
Complicating a local septic focus
(2) **Residual abscess:**
Left behind a diffuse peritonitis

Sites (1) **Iliac fossa** ·
(a) Right
(b) Left
(2) **Pelvis**
(3) Subphrenic
(4) Central

Clinic (1) General toxæmia
: **Raised temperature**
(2) Local
(a) Localised peritonitis
Pain + tenderness + rigidity
↓ (b) **Mass**
↓ (c) Abscess
(3) Regional
: **Irritation syndrome:**
(a) Diaphragmatic irritation
(b) Pelvic visceral irritation
(α) Proctitis
(β) Cystitis
(4) Special
(a) X Rays diaphragmatic abnormality
(b) Blood **leucocytosis > 20,000**

Compl · **Rupture** → (a) Peritonitis
(b) Fistulæ. (α) External
(β) Internal

Treat **Immediate evacuation and drainage:**
After complete localisation
Without contamination of general cavity

Tech (A) Abscess adherent to anterior abdominal wall
Incision directly over
(B) Deep abscesses adherent to post abd wall
Indirect retroperitoneal route
(C) Deep central abscess
(1) (*a*) Laparotomy
↓ (*b*) Isolation of the abscess
↓ (*c*) *Aspiration of pus*
↓ (*d*) Water tight drainage tube
or (2) (*a*) Laparotomy
↓ (*b*) Leave the drain *upto* the abscess wall
↓ (*c*) Wait for 48 hours
↓ (*d*) Open by sinus forceps through the tube (if no auto burst)

(I) ILIAC ABSCESS

(A) **Right iliac abscess**

Causes (*a*) **Intraperitoneal**
(α) Acute suppurative **appendicitis**
(β) Meckel s diverticulitis
(γ) Cæcal (1) Tuberculosis
(2) Carcinoma
(3) Actinomycosis
(*b*) **Retroperitoneal**
(α) Ext iliac lymphadenitis
(β) **Psoas abscess**
(γ) *Retroperitoneal* **appendicitis**

Varieties (1) **Secondary** To local focus (appendicitis)
(2) Residual duodenal perforation
(3) Post operative

Extensions (1) **Lumbar**
(2) **Pelvis**
(3) Horse shoe
(4) Subphrenic
(5) Retroperitoneal

(B) ***Left iliac abscess***

Causes (*a*) Appendicitis
(*b*) Carcinoma sigmoid
(*c*) Diverticulitis
(*d*) Iliac lymphadenitis
(*e*) Psoas abscess

Treatment of iliac abscess

Anæsth (*a*) Regional
(*b*) Spinal
(*c*) *General*

Steps. (A) **Intraperitoneal abscess:**

Incision: (a) 2" trans inwards from ant sup spine

↓ (b) Direct approach
If peritoneum adherent to abscess

or (b) Retroperitoneal approach.
If perit movable over the abscess

↓ (c) Search for possible extensions
(α) Lumbar
(β) Pelvis

↓ (d) ? Appendicectomy
Only if appendix lies free in cavity

↓ (e) Drainage
(α) Through external angle of incision
(β) Counter incision in the loin
(γ) Pelvic (1) Rectal
(2) Vaginal
(3) Suprapubic

(B) **Retroperitoneal abscess:**

Incision Just above and parallel to outer half of the Poupart ligament

(3) SUBPHRENIC ABSCESS

Def Collection of pus under the diaphragm

Varieties (A) **Intra-peritoneal:**

(a) **Right:**
(α) Postero superior
(β) Antero superior
(γ) **Inferior:** Morison

(b) **Left:**
(α) Superior
(β) Antero inferior
(γ) Postero inferior lesser sac

(B) **Retro-peritoneal**

(a) **Posterior:** Perinephric
(b) Anterior

Etio (1) Gastric perforations
(2) Duodenal perforations
(3) Gall bladder inflammations
(4) Appendicitis
(5) Pancreatitis
(6) Perinephric abscess

Path *Routes of infection*
(1) Direct
(2) Intra peritoneal. from peptic perforation
(3) Lymphatic: from appendix, gall bladder

(4) Blood stream
  (a) *Portal pyæmia*
  (b) Systemic pyæmia
(5) Retro peritoneal
  From pancreas kidney, appendix

Anatomy

Site	*Space*	*Etiology*
Right Intra peritoneal **Postero superior**	*Between* (a) Diaphragm (b) Right lobe liver **Below rt lateral lig**	(a) Pyloro duoden (b) Gall bladder
Right Intra peritoneal ***Antero superior***	Between (a) Diaphragm (b) *Right lobe liver* **Above rt lateral lig**	(a) Pyloro duoden (b) *Gall bladder*
Right *Intra peritoneal* **Inferior**	**Right renal pouch**	(a) Pyloro duoden (b) *Gall bladder* (c) Rt iliac fossa
Left *Intra peritoneal* **Superior**	Between (a) Diaphragm (b) Left lobe liver Above left lat lig	Stomach
Left Intra peritoneal **Antero inferior**	*Between* (a) Liver (b) Stomach	*Gastric perforation*
Left Intra peritoneal **Postero inferior**	**Lesser sac**	(a) Stomach (b) Pancreas (c) Gastro jejunum
Retro peritoneal **posterior**	**Phrenico lumbar**	(a) Retro append (b) Perinephric abs (c) Diverticulitis (d) Pancreatitis
Retro peritoneal anterior	In front of coronary ligament	Umbilicus

Common causes (1) **Appendicular**
Causes (a) Delayed appendicectomy
  (b) Failure to drain
Routes (a) Intra peritoneal paracolic
  (b) *Retro peritoneal*
  (c) Lymphatic

(2) **Gastro duodenal:**

Cause · Perforation

Clinic. Abscess may contain gas

(3) **Hepato-biliary:**

Causes (*a*) Amœbic abscess

(*b*) Cholecystitis

Suppurative and perforative

Clinical types. (A) **Sthenic:**

(*a*) Initial acute intra peritoneal focus

↓ (*b*) Acute upper peritonitis

↓ (*c*) Acute abscess

\+ (*d*) General sthenic toxæmia

(B) **Asthenic:**

(*a*) Initial intra peritoneal focus

↓ (*b*) Subsidence

↓ (*c*) Insidious non acute upper peritonitis

\+ (*d*) General asthenic toxæmia

(C) **Latent:**

General sepsis with no local signs

(D) **Post-operative:**

(*a*) Operation for an abdominal focus

↓ (*b*) Latency

↓ (*c*) General sepsis with or without local signs

Clinic (A) **Stage of subphrenitis·**

(1) **Pyrexia**

(2) Pain *relation to respiration*

(3) Diaphragmatic irritation

(*a*) Dry cough

(*b*) Hiccup

(*c*) Dyspnœa

(4) **Local tenderness**

(*a*) Anterior phrenic spot

10th rib in mid clavicular line

(*b*) *Posterior phrenic spot*

Post end of last inter costal space

(*c*) Superior phrenic spot

Between sternomastoid heads

(*d*) Right 12th rib

(*e*) Right flank

(*f*) Costal margin

(5) **Thorax basal signs.**

Deficient air entry

(6) **X-Rays:**

Impaired mobility of diaphragm

(B) **Stage of subphrenic abscess:**
- (1) **Pyrexia: High and remittent**
- (2) Pain pronounced
- (3) Diaphragmatic irritation + +
- (4) **Local tenderness**: More acute
- (5) Local. (a) Swelling
  - (b) Rigidity
  - (c) Dullness × tympanitis
- (6) **Basal: Effusion** or pneumonia
- (7) Blood. **leucocytosis > 20,000**
- (8) **X-Rays:**
  - (a) Immobility
  - (b) Elevation } of diaphragm
  - (c) Domeshape

Diff diag (1) **Liver affections:**
- (a) Amœbic abscess
- (b) Pylephlebitis with portal pyæmia
- (c) Congestive enlargement

(2) **Basal thoracic affections:**
- (a) Pleurisy with effusion
- (b) Empyema
- (c) Basal pneumonia

(3) **Kidney affections**

(4) Any other upper abdominal
- (a) Inflammation
- (b) Tumour

(5) **Superficial sepsis**: Thoracic or abd wall

(6) **Fevers:**
Typhoid, malaria

Compl (1) **General**: (a) Toxæmia
- (b) Septicæmia
- (c) Pyæmia

(2) **Basal thorax**; (a) Pleurisy
- (b) Empyema
- (c) Pneumonia

(3) **Perforation: Into**
- (a) Pleura empyema
- (b) Peritoneum peritonitis
- (c) Pericardium pyopericardium

Treat (A) *Preventive*
Prompt & efficient treat of causative lesion

(B) *Conservative*
Ind Subphrenitis
Tech: (a) **Removal + drain. of primary lesion**
- (b) Rest + heat: local
- (c) Chemo therapy
- (d) Anti serum therapy

(C) *Operative*

Exploration → Evacuation → Drainage

(1) *Extraperitoneal route*

(*a*) Posterior extraperitoneal

Ind (α) Right postero-superior
(β) Right inferior
(γ) Left postero inferior
(δ) Retroperitoneal posterior

Position Renal

Anæsth (α) General
(β) Paravertebral

Steps (1) Incision over the last rib
↓ (2) Subperiosteal resection last rib
↓ (3) Transverse incision
(*a*) Across the bed of the rib
(*b*) At the level of 1 L vertebra
(*c*) Through the diaphragm
↓ (4) Peel off the peritoneum
From the diaphragm
↓ (5) Exploration of the abscess
(*a*) Finger
(*b*) Aspiration needle
↓ (6) Evacuation
↓ (7) Drainage

(*b*) Anterior extraperitoneal

Ind (α) Right antero superior
(β) Left superior
(γ) Left antero inferior

Steps (1) Incision
Below and parallel to costal margin
↓ (2) Peel off the peritoneum
From the diaphragm
↓ (3) Exploration of the abscess
(*a*) Finger
(*b*) Aspiration needle
↓ (4) Evacuation
↓ (5) Drainage

(2) *Transpleural route*

Ind Complicating empyema

Steps (*a*) Aspiration-confirmation of empyema
↓ (*b*) Resection of lower two ribs
↓ (*c*) Evacuation of empyema
↓ (*d*) Dilatation of phrenic perforation
↓ (*e*) Drainage
(α) Empyema
(β) Subdiaphragmatic abscess

(3) PELVIC ABSCESS

Def Collection of pus in true pelvis

Etio. (A) True pelvis pelvic sepsis
: **Female genital sepsis** · Salpingitis
(B) False pelvis iliac sepsis
(*a*) **Acute appendicitis**
(*b*) Acute diverticulitis
(C) General peritoneal cavity. treatment sepsis
(*a*) Acute diffuse peritonitis
\+ (*b*) **Fowler's position**

Clinic. (1) **History of primary septic focus:**
(*a*) *Salpingitis*
(*b*) Appendicitis
(*c*) Any other peritonitis
(2) **Pelvic visceral irritation:**
(*a*) Bladder. tenesmus
(*b*) Rectum proctitis
(3) **General signs of sepsis:**
Temperature +
(4) **Rectal examination.**
(*a*) Tenderness
(*b*) Bogginess
(*c*) Mucus
(5) **Blood examination.**
Leucocytosis > 20000

Compl (1) Perforation Into
(*a*) Rectum
(*b*) Bladder
(*c*) Vagina
(*d*) Peritoneal cavity
(2) Spreading general peritonitis

Treat (A) **Incision + evacuation + drainage**
\+ (B) **Treatment of primary focus:** If feasible
(1) **Rectal route:**
Ind Rectum adherent to abscess
Steps (*a*) Stretching of anal sphincter
↓ (*b*) Aspiration needle
Through adherent spot
↓ (*c*) Scalpel opening
↓ (*d*) Dilatation by forceps
↓ (*e*) Drainage tube
Fixed to rectal wall
(2) **Vaginal route:**
Ind Vagina adherent to abscess
Steps. (See above)
(3) **Iliac route:**
Ind (*a*) Extension from iliac fossa
(*b*) Non adherent to rectum or pelvis

Danger: (1) Soiling of pelvis
If there is no infection
(2) Drainage not free
(3) Secondary hæmorrhage

(4) **Suprapubic route:**
Ind: (1) Residual abscess
(2) Desperate diffuse peritonitis.
(See under Acute Peritonitis)

(C) CHRONIC PERITONITIS.

Path. types: (1) *Chronic or sub acute pyogenic peritonitis*
Etio: Gunshot wounds
Clinic: (*a*) Chronic general toxæmia
(*b*) Inflammatory swellings in abdomen

(2) *Chronic gonococcal peritonitis*
Etio: Gonococcal salpingitis
Clinic. Adhesive pelvic peritonitis
Compl. Intestinal obstruction

(3) *Chronic pneumococcal peritonitis*
(*a*) Ascitic
(*b*) Encysted
(*c*) Adhesive

(4) *Chronic tuberculous peritonitis*
Etio: Age: (*a*) Acute and subacute in children
(*b*) Chronic in adults
Predisp. Raw cow's milk
Bact: Bovine tubercle bacillus
Path: Source of infection.
(*a*) Hæmatogenous: phthisis
(*b*) Ingestion tuberculous sputum
(*c*) Abdominal foci
(α) Mesenteric lymph glands
(β) Intestines. appendix, ileum, cæcum
(γ) Pyosalpinx

Clinical types: (A) *Ascitic:* wet type
Clinic: (*a*) Children
(*b*) **Insidious ascites**
(*c*) T B Toxæmia
Treat: (1) **Exploratory laparotomy**
↓ (2) Evacuation of fluid
↓ (3) Oxygenation of peritoneum
↓ (4) Closure without drainage

(B) *Adhesive or plastic* dry type
Clinic: (*a*) **Doughy abdomen:**
(α) Swollen
(β) Slightly tender
(γ) Diffusely resistant

(b) **Sausage-shaped omentum**
(c) Matted intestines
(d) **General tuberculous toxæmia:**
(α) High swinging temp.
(β) Sweating
(γ) Loss of flesh

Diff. diag (a) Malignant abdomen
(b) Intussusception
(c) Chronic gastro jejunal perforation

Compl: (1) **Intestinal obstruction**
(2) Peritoneal abscesses
(3) **Fæcal fistulæ**

Treat. Conservative

(C) *Ulcerative:* fistulous type
Path: (1) Intestinal ulceration
↓ (2) Intestinal perforation
↓ (3) Local peritoneal abscess
↓ (4) Fæcal fistula.
(a) Internal
(α) Visceral
(β) Peritoneal
(b) External

(D) *Encysted* purulent type
Etio Tabes mesenterica
Path (a) Caseation
↓ (b) Rupture
↓ (c) Local tuberculous abscesses
↓ (d) Local cysts

Diff diag. Ovarian or mesenteric cysts

(E) *Chronic miliary*

Diagnosis (1) Local condition
(2) General tuberculous toxæmia

Compl (1) **Intestinal obstruction:**
(a) Chronic
(b) Acute on chronic
(2) **Fæcal fistula:**
(a) Insidious
(b) Post operative
(3) Acute peritonitis or perit. abscess
(4) Tuberculous toxæmia

Treat. **Conservative anti-tuberculous:**
Except (a) Ascitic peritonitis
(b) Local focus:
(α) Drainage of an abscess
(β) Short circuit
(γ) Excision
(c) Intestinal obstruction
(d) Doubtful diagnosis

(5) *Chronic septic peritonitis* residual
Incompletely resolved acute diffuse perit.

(6) *Encapsulating chronic peritonitis*
Def Development of thick contractile **membrane**, enveloping intest and mesentery
Etio Unknown, ? T B
Clinic (A) Obstructive type
Intestinal obstruction
(B) Carcinomatous type
Tumour
Diagnosis **'Resonant ovarian cyst'**
Treat (*a*) Decapsulation
(*b*) Short circuit

(7) *Chronic post operative peritonitis*
Etio (*a*) Residue of acute post operative perit
(*b*) **Nature of infection**
(α) Tuberculosis
(β) Actinomycosis
(*c*) **Intractable focus**
(α) Fæcal fistula
(β) Carcinoma
(*d*) **Foreign body** left in
(α) Abdominal mops
(β) Drainage tubes
Clinic (*a*) Unhealing sinus or fistula
(*b*) Adhesion with int obstruction
Compl (1) Intestinal obstruction
(*a*) Adhesions
(*b*) Matting
(2) Unhealing sinus or fistula
(3) Toxæmia
Treat Treat the etiology

Clinical types of chronic peritonitis

(1) *Chronic adhesive peritonitis*
Syn (*a*) Hyperplastic peritonitis
(*b*) Sclerosing peritonitis
Etio Chronic or recurrent inflammation
(*a*) Repeated operations
(*b*) Specific (α) T B
(β) Syphilis
Path Fibrosis → (*a*) Contractions
(*b*) Adhesions
(1) Bands
(2) Kinks
(3) Compression
(4) Displacements

(5) Distortions
(6) Volvulus
(7) Membranes
(8) Thickenings
Clinic: (a) Chronic intestinal obstruction
(b) Palpable swellings
Treat. (A) Local:
(a) Short circuit
(b) Excision
(B) General: conservative

(2) *Chronic serous peritonitis:*
Etio: Tuberculosis
Clinic (a) Insidiously increasing fluid in abdomen
(b) General wasting
Diff diag (1) T. B.
(2) Carcinomatosis
(3) Ascites
(4) Ovarian or mesenteric cyst
Treat (a) Paracentesis
(b) Exploration → evacuation → closure

(IV) TUBERCULOUS ABDOMEN:

Etio (a) Children and adolescents
(b) Mahomedan females
Path (a) Ingestion of raw cow's milk Bovine
(b) Ingestion of tuberculous sputum
Secondary to phthisis

Types: (A) **Tuberculous enteritis**: (See under Intestines)
Path · (1) **Small intestines**: Ulcerative
(a) Multiple transverse ulcers
↓ (b) Multiple stenosis
(2) **Cæcum**: Hyperplastic
(a) Cæcal hyperplasia
↓ (b) Intestinal obstruction
(3) **Colon**: Ulcerative
Clinic (1) Intestinal colic
(2) Diarrhœa
(3) Tumid, resistant, tender abdomen
(4) Tuberculous toxæmia
Clinical types (a) **Ulceration**: Diarrhœa
(b) **Stenosis**: Intestinal obstruction
(c) **Hyperplasia**: Intestinal obstruction
(d) **Fistula**: Fæcal fistula

(B) **Tabes mesenterica**:
Etio: Commonest form
Path: (a) Ingestion of raw infected milk
↓ (b) Intestines
↓ (c) Mesenteric glands

Clinic types (1) Latent general tuberculous toxæmia
(2) Palpable mesenteric glands
(3) Chronic dyspepsia
(4) Abdominal colic → intestinal obstruction
(5) Tuberculous peritonitis
(6) Caseated gland
(*a*) Local abscess
(*b*) Mesenteric pseudocyst
(7) Radiographic shadows

Diff diag (*a*) Appendicitis
(*b*) Tuberculous intestines
(*c*) Carcinoma
(*d*) Cyst
(*e*) Stone shadows

Compl (1) T B Peritonitis
(2) Intestinal obstruction

Treat (1) **Conservative** Anti tuberculous
(2) Operative
Ind Appearance of complication
(*a*) T B periton tis
(*b*) Intestinal obstruction
(*c*) Abscess or cyst formation

(C) **T. B peritonitis** (See above)

Clinic (1) Acute miliary tubercular peritonitis
(2) Chronic tuberculous peritonitis
(*a*) Chronic miliary
(*b*) Ascitic
(*c*) Adhesive or plast c
(*d*) Ulcerative or fistulous
(*e*) Encysted or purulent

Examin (1) Stools T B
(2) X Rays calcareous glands
(3) Tuberculin test of value within first 3 years
(*a*) Positive (α) Disease present
(β) Disease past
(*b*) Negative (α) Disease absent
(β) Disease acute
(1) Acute miliary
(2) Acute exacerbation

Diff (*a*) Chronic dyspepsia
(*b*) Chronic enteritis or colitis
(*c*) Acute or chronic intestinal obstructions
(*d*) Acute or chronic peritonitis
(*e*) Causes of ascites
(*f*) Causes of abdominal tumour
(*g*) Causes of fæcal fistulæ

Compl (*a*) Acute peritonitis
(*b*) Chronic adhesive peritonitis

(c) Strictures
(d) Adhesions
(e) Fistulæ
(f) Mass formations
(g) Intestinal obstruction
(h) General T B toxæmia

Treat **Conservative** Except
(A) Ascitic type
Exploration → evacuation → closure
(B) Local type
(a) Short circuit
(b) Excision
(C) Complicated type
(a) Intestinal obstruction
(b) Abscess formation

Compl (1) Fæcal fistula
(2) Persistent sinus
(3) Adhesions

(V) NEOPLASMS OF THE PERITONEUM.

(1) DIFFUSE CARCINOMATOSIS

Etio (a) Any intra abdominal carcinoma
(α) Stomach
(β) Cæcum
(γ) Sigmoid
(δ) Rectum
(b) Carcinoma breast

Clinic (1) **Multiple, hard, small, warty growths**
All over the peritoneum
(a) Greater omentum
(b) Ovaries Krukenberg s tumours
(c) Douglas pouch
(2) **Hæmorrhagic fluid**

Diff diag (1) Miliary tuberculosis
(2) Fat necrosis
(3) Carcinomatosis
} growths
(1) Acute pancreatitis
(2) Acute strangulation
(3) Carcinomatosis
} hæmorrhagic fluid

(3) PSEUDOMYXOMA PERITONAEI

Etio (1) Mucoid **ovarian** cystadenoma
(2) Mucocele of the **appendix**
(3) Mucoid **carcinoma**

Clinic Localised or diffuse myxomatous deposits

Compl (a) Recurrence
(b) Local malignancy

Treat: (1) Removal of primary focus
(2) Thorough peritoneal toilet
(3) Deep X-Rays

(VI) ASCITES:

Def: Collection of serous fluid in the peritoneal cavity

Clinic: (1) Inspection:
- (*a*) Uniform distension of the abdomen.
  - (α) With bulging of the flanks
  - (β) With bulging of dependant part
- (*b*) Flat or protruding umbilicus
- (*c*) Shiny, tense skin.
  - : With visible veins
- (*d*) Pressure effects:
  - (α) Displaced heart
  - (β) Œdematous lower limbs

(2) *Palpation*
- (*a*) Thrill
- (*b*) Dipping

(3) Percussion
- (*a*) Dullness in flanks when supine
- (*b*) Horse shoe dullness
- (*c*) Shifting dullness on change of posture

(4) Mensuration
- Umbilicus (*a*) Nearer pubes
  - (*b*) Equidistant from ant. sup. spine

(5) Paracentesis

Diff. diag: (1) **Tympanitis:**
- (*a*) Resonance
- (*b*) No thrill
- (*c*) Visible coils

(2) **Ovarian cyst:**
- (*a*) Origin from pelvis
- (*b*) Umbilicus · (α) Nearer ensiform
  - (β) To one side
- (*c*) Dullness: (α) Present in front
  - (β) Absent in flanks
  - (δ) Convex upper border
- (*d*) Vaginal exam uterus displaced
- (*e*) Blaxland: flat ruler test
  - Aortic pulsation transmitted

(3) **Gravid uterus with hydrops amnii:**
- (*a*) Signs of pregnancy
- (*b*) Dullness in front, resonant flanks
- (*c*) Varying consistency of the uterus
  - . On contraction and relaxation

(4) **Distended bladder:**
- (*a*) Incontinence with overflow
- (*b*) Suprapubic tumour

(c) Dullness in front; resonant flanks
(d) Passage of a catheter

(5) **Large abdominal cysts:**
(α) Hydronephrosis
(β) Pancreatic cyst
(γ) Mesenteric cyst
(δ) Retroperitoneal cyst

Diag: (a) Enlargement not uniform
(b) Examination of the fluid

(6) **General obesity:**
(a) Deep umbilicus
(b) General obesity

(7) **Phantom tumour:**
(a) Anæsthesia
(b) Age. (α) Hysterical adolescents
(β) Climacteric

Causes: (A) **Diseases of the peritoneum:**
(1) Non suppurative acute peritonitis
(2) Simple **chronic peritonitis**
(3) **Tuberculous peritonitis**
(4) **Malignant peritonitis**
(5) **Polyserositis**

(B) **Systemic back pressure:**
(1) **Chronic heart failure:**
(a) Valvular disease
(b) Chronic myocardial affections
(c) Adherent pericardium
(2) Heart failure secondary to chronic lung
(3) Heart failure. due to hyperpiesia

(C) **Portal back pressure:**
(α) **Portal vein:**
(1) Non-suppurative portal thrombosis
(2) Enlarged portal lymph glands
(3) Pressure of tumours.
. Of surrounding organs
(β) **Liver affection** ✱
: Cirrhosis liver

(D) **Inferior vena cava obstruction:**
(1) Thrombosis
(2) Chronic mediastinitis
(3) Mediastinal new growth

(E) **Kidney diseases:**
(1) Dropsy (nephritis and nephrosis)
(2) Secondary to **kidney heart**
(3) Kidney peritonitis

(F) **Splenic diseases:**
(1) Splenic anæmia

(2) Banti
(3) Leukæmias
(G) **Lymphatic obstruction:** Chylous ascites
(1) Severe trauma to abdomen or chest
(2) Elephantiasis
(3) Retroperitoneal or mediastinal sarcoma

Treatment: (A) **Paracentesis abdominis:**
Prep: (*a*) Empty the bladder
(*b*) Half-sitting position
(*c*) Abdominal binder
Site: Midline, midway between umbilicus & pubes
Instrument: Trocar and cannula
Direction: Backwards and slightly downwards
Post: Stimulant dose
Compl: (*a*) Shock
(*b*) Visceral trauma
(*c*) Adhesive peritonitis
(B) **Talma-Morison omentopexy:** (See under Liver)
(C) Paterson glass bobbin
(D) Wynter's femoral drainage.
Ind: Chronic alcoholic cirrhosis of the liver
· Which has withstood many tappings

(II) THE GREAT OMENTUM

(1) LOCAL ACUTE OR CHRONIC PERITONITIS:
: **Adhesion** of the omentum around the focus
(Policeman of the abdomen)
: (Absent in virulent forms of peritonitis)

(2) TUBERCULOSIS·
(A) **Miliary tuberculosis:**
Diff. diag: (*a*) Carcinomatosis
(*b*) Fat necrosis
(B) **Sausage mass:**
Clinic: Transverse supra umbilical
Diff. diag: (*a*) Carcinoma stomach or colon
(*b*) Chronic gastro-jejunal perforation
(*c*) Intussusception
(*d*) Tabes mesenterica

(3) SECONDARY CARCINOMA
Etio: Any intra abdominal carcinoma
Clinic (*a*) Ascites with blood stained fluid
(*b*) Secondary firm, multiple nodules

(4) SARCOMA.
(*a*) Painful tumour
(*b*) Blood-stained ascites
(*c*) Cachexia

(5) FAT NECROSIS

Etio Acute pancreatitis
Path (See under Pancreas)
Clinic (a) Opaque yellow, varying sized, scattered
(b) Blood stained fluid
(c) Acute pancreatitis
Diff diag (1) Miliary tuberculosis
(2) Carcinomatosis

(6) TORSION One of the causes of acute abdomen

Etio Bulky omentum with abnormal attachment
Sites (a) Hernial sac
(b) General peritoneal cavity
Clinic Acute abdomen
Diff diag (a) Strangulated hernia
(b) Acute appendicitis

(7) OMENTOCELE

Omentum in a hernial sac

(8) OPERATIONS ON OMENTUM

(A) **Excision**
Ind (a) Prolapse
(b) Omentocele
(c) Adhesions
(d) Local focus
(e) Along with gastrectomy
Tech (1) Always transfix before ligature
(2) Use silk
(3) Always look for bleeding from the stump
Before returning into abdomen
(4) Do not tie too loose or too tight ligatures
(5) Bury the raw stump

(B) **Omentopexy** (See under Liver)

(C) **Free omental graft**
Used as a cover over any intestinal suture
(a) Closure of perforations
(b) Intestinal anastomosis
(c) Covering raw areas

(D) **Intestinal and peritoneal drainage tube**
Bring out through the omentum

(III) MESENTERY

(I) TRAUMA

(1) CONTUSION OR HÆMATOMA

Etio (1) Closed trauma
Run overs impacts blows

(2) Stab or gunshot wounds :
: With injury to vessels
Path . Collection of blood between the two leaves
Clinic : (1) History of trauma
↓ (2) Paralytic ileus
Compl : (1) Paralytic ileus
(2) Gangrene intestines
• Treat : (1) Conservo observative
↓ (2) Operative
Ind : Gangrene intestines

(2) WOUNDS AND LACERATIONS ·
Etio . (1) Run overs
(2) Stab or gunshot wounds
Path : (a) Longitudinal tears
(b) Transverse tears
: With injury to vessels
Compl : (1) Hæmatoma mesentery
(2) Hæmo peritoneum
(3) Gangrene intestines . transverse tears
(4) Associated trauma to other viscera
Treat . (A) Immediate exploration
↓ (B) Longitudinal suture
or (C) Resection intestines
Ind Transverse tear

(II) CIRCULATORY BLOCK :

(1) MESENTERIC VESSEL THROMBOSIS.
(See page 1214)
Etio Past middle life
Causes (1) Heart disease . endocarditis
(2) Splenectomy . for splenic anæmia
(3) Arteriosclerosis
Path : (a) Endocarditis
↓ (b) **Mesenteric embolism**
↓ (c) Œdema and congestion . if venous
or (c) Ischæmia if arterial
↓ (d) **Gangrene intestines**
Clinic : (1) Sudden severe abdominal pain
(2) **Hæmatemesis + blood in stools**
(3) Hæmorrhagic peritoneal fluid
(4) **Acute intestinal paralysis** syndrome
(5) Absence of tenderness and rigidity
(6) **Some vascular focus**
Treat : Early exploration → intestinal resection

(2) TORSION OF THE MESENTERY
Etio : (a) Length +
(b) Inflammatory adhesions
(c) Bulky and heavy adhesions

Exciting: Laborious work
Sites: (1) Small intestines mesentery
(2) Sigmoid mesentery
Path: (1) Vascular and nervous obstruction
↓ (2) Congestion
↓ (3) Thrombosis
↓ (4) Ischæmia
↓ (5) Gangrene intestines
Clinic: Intestinal volvulus syndrome
Treat: (See under Volvulus)

(III) MESENTERIC GLANDS:

(1) SEPTIC LYMPHADENITIS.

Etio. Tonsillitis
Site: Ileo cæcal angle
Bact: Pyococci
Clinic: (*a*) Children
(*b*) Acute inflammatory abdomen
Diff. diag: Acute appendicitis
Compl: (*a*) Recurrence
(*b*) Abscess
(*c*) Peritonitis
(*d*) Intestinal obstruction
Treat: (A) Conservative.
(*a*) Rest: Ochsner-Sherren
(*b*) Sulphonamides
(B) Operative
Ind: Complications
Tech. (*a*) Drainage of the abscess
(*b*) Drainage of the peritoneum

(2) TABES MESENTERICA:

: (See under Tuberculous Abdomen)

(3) LYMPHADENOMATOUS GLANDS.

(*a*) Palpable abdominal glands
(*b*) Pressure syndrome
(α) Jaundice
(β) Portal obstruction
(c) Other signs of lymphadenoma.
(α) Enlarged glands all over
(β) Enlarged spleen
(γ) Anæmia, etc.

(4) SECONDARY CARCINOMATOUS GLANDS

(IV) MESENTERIC CYSTS:

Varieties: (1) Traumatic: blood cyst
(2) Tuberculous: chronic glandular abscess
(3) Hydatid
(4) Dermoid
(5) Chylous

(6) Congenital (Personal case)

Clinic New born child with acute intestinal obstruction
Moderate distension of abdomen, below the umbilicus

Operation (a) Big mesenteric cyst
(b) High & rudimentary cæcum & appendix
(c) Volvulus with gangrene of ⅓rd of ileum

Result Death 3 days after operation
4 days after birth

Clinic **Tillaux's triad:**
(a) Fluctuating swelling
(b) Moves at right angles to mesenteric axis
(c) Resonance around and across

Compl (1) Intestinal obstruction
(2) Rupture
(3) Hæmorrhage
(4) Torsion
(5) Incarceration into pelvis

Treat (1) Marsupialisation
(2) Excision
Mind the viability of intestines

(V) MESENTERIC NEW GROWTHS:

(1) Benign Lipoma, fibroma
(2) Malignant Secondary carcinoma

(IV) RETROPERITONEAL SPACE

(I) TRAUMA:

(1) **Retroperitoneal hæmorrhage.**

Etio Stab wounds back, run overs

Site (1) Perinephric space
(2) Root of the mesentery

Compl (a) Sepsis
(b) Paralytic ileus

(2) **Retroperitoneal rupture:**

Sites (a) Kidney
(b) Duodenum
(c) Colon
(d) Pancreas

Path Retroperitoneal cellulitis
(a) Pyococcal
(b) Anærobic

Compl (1) Diffuse gangrene of abdominal wall
(2) Abscesses
(3) Fistulæ or sinuses

(II) INFLAMMATION:

(1) RETROPERITONEAL CELLULITIS·

Etio (1) **Trauma:**
- (*a*) Accidental ruptures of
  - (1) Kidneys and ureters
  - (2) Pancreas
  - (3) Duodenum
  - (4) Colon
- (*b*) Operative trauma in Sliding hernia

(2) **Posterior duodenal perforations**
(3) **Acute pancreatitis**
(4) **Perinephric infections**
(5) **Retrocæcal appendicitis**
(6) **Extravasation of urine**
(7) **Parametrial infections**

Clinic (*a*) Primary etiological focus
(*b*) Spreading inflammatory phenomena
(*c*) Acute general toxæmia

Treat (A) General anti toxic measures
(B) Treatment of etiological factor
(C) **Free drainage**

(2) RETROPERITONEAL ABSCESS

(A) **Subphrenic:** (See under Subphrenic Abscess)

(1) *Retroperitoneal posterior*
Syn Phrenico lumbar
Etio (*a*) **Retrocæcal appendix**
(*b*) **Perinephric abscess**
(*c*) Diverticulitis
(*d*) Pancreatitis

(2) *Retroperitoneal anterior*.
Syn Bare area of the liver
Etio Umbilical sepsis

(B) **Perinephric:** (See under Kidney)

Etio (1) Kidney infections
(2) Retrocæcal appendicitis
(3) Pyæmic

Treat. Drainage

(C) **Lumbar:**

Etio (*a*) Kidney infections
(*b*) Appendicular infections
(*c*) Diverticulitis

(D) **Iliac:**

Etio (1) *Acute:* (*a*) Acute retrocæcal appendicitis
(*b*) Acute diverticulitis

(c) Urinary extravasation
(d) **Acute lymphadenitis:**
Etio Lower limb infection
Age Children
Site External iliac
Clinic Pseudo appendicitis
Diff diag Appendicitis
Treat (1) Extra peritoneal incision
↓ (2) Drainage

(2) *Chronic* Psoas abscess

(IV) TUMOURS·

(1) **Sarcoma:**
Etio Commonest
Site Perinephric
Clinic (1) Immobile, irregular, fixed, rapid tumour
(2) Cachexia with irregular temperature
Diff diag Any intraperitoneal tumour

(2) **Neuroblastoma:**
Etio Children
Clinic Rapid growth

(3) **Ganglioneuroma:**
Clinic Slow growth

(4) Lipoma, liposarcoma
(5) Teratoma

(V) IMPORTANT POINTS

(1) Synopsis of operative treatment of acute peritonitis
(A) Desperate condition
Blind suprapubic drainage in bed
(B) Bad condition
(a) Blind cæcostomy or enterostomy
+ (b) Suprapubic drainage
(C) Fair condition
(a) Primary focus diagnosed
(α) Treat the primary focus
(β) Peritoneal toilet
(γ) Drainage
(b) Primary focus uncertain
(α) Gridiron appendix exploration
↓ (β) General exploration

(2) *Primary cæcostomy or enterostomy is a life saving measure in advanced cases of general peritonitis.*

(3) Post-operative peritonitis de novo is commonest after abdomino perineal resection of rectum.

(II) INFLAMMATION:

(1) RETROPERITONEAL CELLULITIS

Etio (1) **Trauma:**
- (a) Accidental ruptures of
  - (1) Kidneys and ureters
  - (2) Pancreas
  - (3) Duodenum
  - (4) Colon
- (b) Operative trauma in Sliding hernia

(2) **Posterior duodenal perforations**
(3) **Acute pancreatitis**
(4) **Perinephric infections**
(5) **Retrocæcal appendicitis**
(6) **Extravasation of urine**
(7) **Parametrial infections**

Clinic (a) Primary etiological focus
(b) Spreading inflammatory phenomena
(c) Acute general toxæmia

Treat (A) General anti toxic measures
(B) Treatment of etiological factor
(C) **Free drainage**

(2) RETROPERITONEAL ABSCESS

(A) **Subphrenic** (See under Subphrenic Abscess)

(1) *Retroperitoneal posterior*
Syn Phrenico lumbar
Etio (a) **Retrocæcal appendix**
(b) **Perinephric abscess**
(c) Diverticulitis
(d) Pancreatitis

(2) *Retroperitoneal anterior*
Syn Bare area of the liver
Etio Umbilical sepsis

(B) **Perinephric**: (See under Kidney)
Etio (1) Kidney infections
(2) Retrocæcal appendicitis
(3) Pyæmic
Treat Drainage

(C) **Lumbar:**
Etio (a) Kidney infections
(b) Appendicular infections
(c) Diverticulitis

(D) **Iliac:**
Etio (1) *Acute*. (a) Acute retrocæcal appendicitis
(b) Acute diverticulitis

(c) Urinary extravasation
(d) **Acute lymphadenitis:**
Etio: Lower limb infection
Age. Children
Site. External iliac
Clinic. Pseudo appendicitis
Diff diag. Appendicitis
Treat. (1) Extra peritoneal incision
↓ (2) Drainage

(2) *Chronic:* Psoas abscess

(IV) TUMOURS:

(1) **Sarcoma:**
Etio Commonest
Site: Perinephric
Clinic: (1) Immobile, irregular, fixed, rapid tumour
(2) Cachexia with irregular temperature
Diff diag: Any intraperitoneal tumour

(2) **Neuroblastoma:**
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(4) *Patients in shock must all be treated conservatively for a few hours unless there is a definite evidence of.*
   (a) *Intraperitoneal hæmorrhage*
   (b) *Perforation of a hollow viscus*

(5) *Most common causes of acute spreading peritonitis*
   (a) *Acute appendicitis*
   (b) *Gastroduodenal perforations*
   (c) *Intestinal obstructions*
   (d) *Pelvic inflammations*
   (e) Typhoid perforations
   (f) Peritoneal trauma

(6) Differential diagnosis between
   (a) Miliary tuberculosis
   (b) Fat necrosis
   (c) Carcinomatosis

(7) The real difficulty in the way of conservatism in the treatment of pneumococcal peritonitis is doubtful diagnosis, if diagnosis of pneumococcal peritonitis is established beyond doubt, conservatism for at least 10 days is preferable to immediate operation

(8) Causes of leakage from intestinal stump or anastomosis
   (a) Distension
      (α) Gas
      (β) Bulky enema
   (b) Poor blood supply
   (c) Incomplete peritoneal covering
   (d) Bursting of the stump due to
      (α) Peristalsis
      (β) Distension

(9) A localised peritoneal abscess must be opened extra peritoneally whenever possible.

(10) *Rise in pulse* associated simultaneously with fall in temperature *is an ominous sign in acute peritonitis*

(11) A correct pre operative diagno is and a good anæsthesia are more than half the battle in the operative treatment of acute peritonitis

(12) *Essential points in surgery of acute peritonitis*
   (a) *Pre operative preparation*
      (α) Antishock
      (β) Antitoxic
      (γ) Alimentary drainage
         (1) Gastroduodenal suction
         (2) Glycerine eremata
   (b) *Efficient anæsthesia*
      (α) No cyanosis
      (β) No rigidity
   (c) *Rapid, delicate and minimum handling*

- (*d*) *No evisceration*
- (*e*) *No unnecessary drains*
- (*f*) *Rational post operative treatment*
  - (α) As in pre operative period
  - (β) Anatomical and physiological rest

(13) *Peritonitic toxæmia and paralytic ileus are the most common acute complications of peritonitis*

(14) L [illegible] the reduced [illegible] Adminis [illegible] is good in diffuse peritonitis

(15) The most common diseases to be differentially diagnosed from primary pneumococcal or streptococcal diffuse peritonitis are
- (*a*) Appendicular peritonitis
- (*b*) Salpingitis
- (*c*) Paralytic ileus

(16) *Patient must be in high Fowler s position if a suprapubic tube has to drain See that every drainage tube is in the most dependant position by appropriate posture*

(17) Never delay spinal anæsthesia (as a treatment) later than the end of second day in a case of paralytic ileus

(18) Leucocytosis of 30 000 or more with 90% polymorphs in a female child under 10 with acute peritonitis
Pneumococcal peritonitis

(19) Post operative internal fæcal fistula should be suspected when the patient suddenly develops signs of general periton tis about the fourth day after appendicectomy especially after an unwise administration of a large enema

(20) Treatment of post operative internal fæcal fistula
- (A) Prophylactic
  - (*a*) Cæcostomy
  - (*b*) Avoidance of early large enema
- (B) Curative
  Immediate external drainage.

(21) Exploration by a needle in a case of intraperitoneal abscess is dangerous

(22) In general peritonitis if a patient is rigid and straining under anæsthesia his chances of survival are nearly halved

(23) 90% of subphrenic abscesses follow infective abdominal lesions, most commonly
- (*a*) Acute appendicitis
- (*b*) Gastro duodenal perforations
- (*c*) Hepato biliary infections.

(24) *Pus somewhere pus nowhere, pus under the diaphragm*

(25) *Needling is dangerous and unnecessary in sub diaphragmatic abscess.*

(26) Sub diaphragmatic abscess:
- (a) *Latent:*
  - : Pus somewhere, pus nowhere, pus under diaphragm
- (b) Suggestive:
  - (1) History of abdominal sepsis or operation
  - (2) General signs.
    - (α) Sthenic toxæmia. fever
    - (β) Asthenic toxæmia. wasting
  - (3) *Local signs:*
    - : Upper abdominitis
  - (4) Chest signs:
    - : Basal thoracic signs
  - (5) Special signs
    - (α) X-Rays. fixation and elevation of diaphragm
    - (β) Leucocytosis

(27) *Fixation and elevation of half of the diaphragm is a definite* evidence of subphrenic abscess or phrenic avulsion

(28) ***In post operative period of any abdominal sepsis, portal pyæmia and subphrenic abscess are great dangers and simulate each other closely.***

(29) Transpleural and transperitoneal routes for evacuation of subphrenic abscess are unsound and dangerous; *the best approach is extra peritoneal after the resection of 12th rib*

(30) Premature drainage of a pelvic abscess through the rectum or vagina—while rectal or vaginal wall can be moved over the abscess—entails risk of pelvic peritonitis or cellulitis.

(31) Rectal or vaginal drainage of pelvic abscess is contraindicated in
- (a) Doubtful diagnosis
- (b) Unilateral abscess
- (c) Rectal or vaginal wall movable over the abscess.

(32) Some points in the drainage of pelvic abscess:
- (a) Operate: when
  - (α) *Abscess is median*
  - (β) Rectum or vagina is adherent to the abscess
- (b) [illegible]
- (c)
- (d)

(33) *Never tap a tuberculous ascites* for fear of perforation.

(34) *Abdominal tuberculosis.*
- (A) *Enteritis:*
  - (a) Multiple ulcerative
  - (b) Hypertrophic
  - (c) Adhesive

(B) *Tabes mesenterica*
- (a) Latent
- (b) Palpable glands
- (c) Alimentary syndrome
  Pain colic, dyspepsia
- (d) Mesenteric pseudocyst
- (e) Radiographic shadows

(C) *Peritonitis*
- (a) Acute miliary
- (b) Ascitic
- (c) Adhesive or plastic
- (d) Encysted
- (e) Complicated
  Secondary to (α) Intestinal focus
  (β) Lymph glandular focus
  (γ) Generative organ focus

(35) Common complications of tuberculous abdomen
- (a) Acute peritonitis
- (b) Acute intestinal obstruction
- (c) Fæcal fistula or unhealing sinus
- (d) Tuberculous septicæmia.

(36) Congenital bilateral hydrocele in a child suspect tuberculous abdomen

(37) *Indications for surgery in tuberculous abdomen*
- (a) *Ascites* laparotomy and evacuation
- (b) *Local variety* (α) Short circuit
  (β) Excision
- (c) *Complications* treatment of
  - (α) Obstruction
  - (β) Acute peritonitis or abscess

(38) *Acute diffuse peritonitis*

(A) *Secondary*
- (a) *Appendicitis*
- (b) Gastroduodenal *perforations*
- (c) Acute intestinal *obstructions*

(B) *Post operative*
- (a) *Continuation of pre operative*
- (b) *Internal leakage*
  - (α) Abscess pus
  - (β) Alimentary contents

(C) *Primary*
- (a) *Pneumococcal*
- (b) *Streptococcal*

(39) *Ascites arising insidiously in a child is almost always due to tuberculosis*

(40) Tuberculosis of intestines
- (a) Ulcerative
- ↓ (b) Stricture

(c) Hypertrophic local
(d) Fistulous
(e) Adhesive
(f) Miliary

(41) Pouring 80–100 c cs of ether or 100 c.cs of 70% alcohol into peritoneal cavity at operation acts by destroying bacteria Use drainage, no Trendelenburg position

(42) Caseous mesenteric gland is a potentially serious condition and may burst at any time giving rise to tuberculous peritonitis

(43) Acute tuberculous peritonitis
(1) Miliary
(2) Obstructive
(3) Perforative (a) Intestinal focus
(b) Glandular focus
(c) Pyosalpinx

(44) Freely mobile rounded non tender cyst in abdomen
(a) ? Ovarian cyst
(b) ? Mesenteric cyst

(45) *Explore every stab wound of the abdomen*

(46) *Most common causes of hæmoperitoneum*
(a) *Rupture spleen*
(b) *Ectopic gestation*

(47) *Most common intraperitoneal perforations*
(a) *Appendicular*
(b) *Gastroduodenal*
(c) *Typhoid*

(48) *Most common abdominal obstructions*
(a) *External strangulated hernia*
(b) *Volvulus* small intestines

(49) Diminution of liver dullness
(a) Perforative peritonitis
(b) Distended colon
(c) Atrophic cirrhosis.

(50) *Upper peritonitis after any abdominal sepsis*
(a) ? Pylephlebitis with portal pyæmia
(b) ? Subphrenic abscess.

(60) *Common complications of peritonitis*
(a) *Paralytic ileus and toxæmia*
(b) *Pelvic abscess*
(c) *Basal complications*
(d) *Parotitis*

(61) Ochsner—Sherren treatment
(a) Localising sepsis
(b) Acute generalised sepsis
(c) Competent observation.

(62) Lower abdominitis in children:
(*a*) Appendicitis
(*b*) Pneumococcal peritonitis
(c) Iliac lymphadenitis.

(63) Stages of acute peritonitis:
(*a*) Peritonism
↓ (*b*) Period of illusion
↓ (*c*) Peritonitis
↓ (*d*) Paralytic ileus + toxæmia → death
or (*d*) Localisation → abscess or fibrosis.

(64) *Perforative peritonitis:*
(*a*) *Board-like rigidity*
(*b*) *Obliterated liver dullness*
(*c*) *Escape of gas on peritoneal incision.*

(65) Sites for secondary carcinoma
(*a*) Liver
(*b*) Omentum
(*c*) Ovaries
(*d*) Pouch of Douglas.

(66) Adhesions to greater omentum:
: Past or present inflammation

(67) In all X Ray shadows in abdominal area, take the plates in two planes Differential diagnosis between.
(A) Stones (*a*) Kidney and ureter
(*b*) Gall bladder
(B) Calcified glands (*a*) Mesenteric
(*b*) Iliac

(68) Omentopexy for ascites does not give good results; patients die of hepatic inefficiency after about a week.

(69) Rectal and bladder tenesmus in Fowler's position:
: ? Pelvic abscess.

(70) Thin bloodstained fluid in peritoneum
(*a*) Streptococcal peritonitis
(*b*) Strangulated intestines
(*c*) Mesenteric thrombosis
(*d*) Acute pancreatitis
(*e*) Carcinomatosis peritonæi
(*f*) Miliary tuberculosis of the peritoneum.

(71) Visceral peritoneum is insensitive to any form of stimulation; parietal peritoneum, especially mesentery, is very sensitive to trauma which produces shock.

(72) B. Coli is the most common causal organism in peritonitis of alimentary origin

(73) Streptococcus is found in half the cases of primary peritonitis.

(74) Remember gonococcus in every case of pelvic peritonitis in females.

(75) Secondary septic peritonitis types
- (a) Sudden and diffuse perforations and ruptures
- (b) Gradual and extending extension from a local focus

(76) *Peritonism* sudden diffuse peritoneal irritation
- (a) *Agonising pain*
- (b) *Severe shock*
- (c) *Initial unrepeated vomit*

(77) In gradual non perforative septic peritonitis symptoms and signs of causative lesion slowly spread into those of general peritonitis

(78) *Prediagnostic morphia and purgative at any time are the deadliest things in acute abdomen*

(79) Acute peritonitis syndrome
- (1) Continuous abdominal pain
- (2) Recurrent small vomits
- (3) Rising pulse
- (4) Rigidity
- (5) Tenderness (a) Ordinary
  - (b) Rebound
  - (c) Referred
- (6) Free fluid in peritoneum
- (7) Dead silence on auscultation

(80) *Conservative treatment of diffuse peritonitis*
- (a) Fowler s position
- (b) Venoclysis except in (α) Hæmoperitoneum
  - (β) Lung complications
  - (γ) Heart complications
- (c) Intramuscular antigasgangrene serum
- (d) Camphor in oil m x two hourly
- (e) Gastric aspiration
- (f) Sulphonamides

(81) Surgical treatment of diffuse peritonitis
- (a) Removal of source of infection
- (b) Peritoneal toilet
- (c) Drainage of
  - (α) Primary focus
  - (β) *Peritoneal pools*
- (d) *Cæcostomy or enterostomy*
- (e) Post operative treatment
  - (α) Paralytic ileus
  - (β) Peritoneal toxæmia.

(82) Desperate cases of diffuse peritonitis
Blind suprapubic drainage in bed
- (a) Catheterise
- ↓ (b) Small suprapubic incision
- ↓ (c) Break through the peritoneum by finger
- ↓ (d) Push in drainage tube.

(83) Every case of diffuse perit must be operated upon except
(a) Gonococcal peritonitis
(b) Post operative septic peritonitis
(c) Primary diffuse peritonitis in children
(d) Moribund patients

(84) *Spinal anæsthesia is best in peritonitis except when circulation is failing when local novocain with sodium evipan may be used*

(85) *Golden rules in diffuse peritonitis*
(a) *Do no more than absolutely necessary*
(b) *Do it as gently and as rapidly as possible*

(86) *Be careful not to receive a needle prick in every case of peritonitis, if received, squeeze out three drops of blood immediately*

(87) Drainage in diffuse peritonitis
(A) Local focus
3 5 days and then gradual shortening
(B) General peritoneal cavity
24 48 hours only, unless draining
(C) Draining intestines
About 6 days till it comes out naturally
(D) Draining any discharge
Till discharge becomes scanty

(88) *Acute appendicitis is the most common cause of both localised and diffuse peritonitis*

(89) Not all cases of subphrenic infection proceed to abscess formation

(90) Frequency of sites in subphrenic abscess
(1) Right postero superior intraperitoneal
↓ (2) Left antero inferior intraperitoneal
↓ (3) Retroperitoneal

(91) Blood transfusion is very good in pneumococcal peritonitis just at the onset of toxæmia

(92) Internal fæcal fistula should be suspected when the patient suddenly develops signs of diffuse peritonitis about the 4th day after appendicectomy, especially after the administration of an ill advised enema

(93) *Do not forget ambulatory typhoid in an unexplained acute diffuse perforative peritonitis* in each case, make inquiries about prevalence of typhoid in the area from which the patient comes

(94) *Main causes of acute peritonitis*
(A) *Primary*
(a) Pneumococcal
(b) Streptococcal
(c) Miliary tuberculous

(B) *Secondary*

(a) *Perforative*
(1) Gastric
(2) Duodenal
(3) Typhoid
(4) Appendicular
(5) Internal fæcal fistula

(b) *Septic inflammatory*
(1) Appendicitis
(2) Cholecystitis
(3) Salpingitis gonorrheal
(4) Post abortional
(5) Acute pancreatitis
(6) Mesenteric lymphadenitis

(c) *Obstructive* Intestinal obstruction
(1) Strangulated hernia
(2) Volvulus
(3) Band and adhesions

(d) *Traumatic*
(1) Ruptures
(2) Contusions

(e) *Irritative*
(1) Hæmoperitoneum
(α) Traumatic
(β) Ectopic gestation
(2) Gastric juice gastric perforation
(3) Bile (α) Duodenal perforation
(β) Biliary passage perforation
(4) Urine rupture bladder

(95) *In the pre operative and post operative or in conservative treatment of acute abdomen* keep one thing in mind *Let the septic focus be the most dependant part at all times by appropriate postures On no account allow the healthy part of the peritoneum to be dependant at any time even for a moment*

(96) *In a case of injury* it is unwise to delay laparotomy if an intraperitoneal injury is suspected *It is better to open and see than to wait and see*

(97) Avoid cutting out a ligature when tying a pedicle

(98) In stab wounds if one wall of a viscus is injured, do not fail to explore the opposite wall

(99) Local tenderness is often the key to the site of intra abdominal rupture.

(100) In contusions or stab wounds of the intestines, the affected part is many a time discovered just under the affected abdominal wall, due to localised ileus

(101) Intestinal ruptures may be multiple, so in every case examine the whole gut

(102) *Apply intestinal clamp on either side of a rupture or perforation, before suturing it.*

(103) Crib's treatment of acute peritonitis

(1) Pre operative gastric lavage + nothing by mouth
(2) Local infiltration + sodium evipan
(3) Accurate clean cut operation
(4) Adequate drainage
(5) Fowler's position
(6) Continuous rectal drip.
5% saline with 5% glucose
(7) Hypodermic saline
2500–3000 c cs every 24 hours
(8) Hypodermic morphia.

(104) Groups of acute peritonitis signs

(A) Acid forming activation
(1) Accelerated pulse and respiration
(2) Raised blood pressure
(3) Pyrexia
(4) Loss of strength and weight

(B) Protective response to infection
(1) Pain + tenderness + rigidity
(2) Intestinal distension + vomiting
(3) Paralytic ileus.

CHAPTER XIV

EXPLORATORY LAPAROTOMY

(I) DEFINITION:

: Surgical incision into the peritoneal cavity through the abdominal parietes

(II) INDICATIONS·

(A) *Urgent or acute abdomen:*

(1) **Congenital abdomen:**
- (a) Imperforate anus
- (b) Exomphalos
- (c) Volvulus neonatorum

(2) **Traumatic abdomen:**
- (a) Hæmoperitoneum
- (b) Closed ruptures and perforations
- (c) Stab and gunshot wounds
- (d) Foreign bodies

(3) **Irritative aseptic peritonitis:**
- (a) Hæmoperitoneum
- (b) Bile peritoneum
- (c) Gastroduodenal extravasations
- (d) Urinary extravasation

(4) **Septic peritonitis:**
- (α) Primary.
  - (a) Pneumococcal
  - (b) Streptococcal
  - (c) Acute tuberculous
- (β) Secondary: to
  - (a) Acute cholecystitis
  - (b) Acute appendicitis
  - (c) Acute salpingitis
  - (d) Acute pancreatitis
  - (e) Acute mesenteric lymphadenitis

(5) **Perforative peritonitis:**
- (a) Gastroduodenal perforation
- (b) Appendicular perforation
- (c) Typhoid perforation
- (d) Ulcerative perforation

(6) **Obstructive acute abdomen;**
- (a) Strangulated hernia
- (b) Volvulus
- (c) Bands, adhesions, apertures, fossæ
- (d) Intussusception
- (e) Torsions

(*f*) Mesenteric thrombosis
(*g*) Tuberculous intestine
(*h*) Carcinoma

(B) *Non urgent exploration:*
(*a*) Doubtful diagnosis
or (*b*) Treatment of a diagnosed focus
+(*c*) Exploration for:
(α) Complications
(β) Associated conditions

(III) PRE-OPERATIVE PREPARATIONS:

(A) *Alimentary system:*

(1) *Oral:*

(*a*) **Attention to teeth:**
(α) Pyorrhea alveolaris
(β) Carious teeth

(*b*) **Antiseptic gargles:**
: Condy's, hydrogen peroxide, listerine

(*c*) **Sialagogues:**
: Lemon to the tongue

(2) *Gastroduodenal:*

(*a*) **Stomach wash:**
Ind: (α) Acute: (1) Acute dilatation of stomach
(2) Acute intestinal obstruction
(3) Acute gastritis
(4) Incessant vomiting
(β) Chronic: (1) Chronic pyloric stenosis
+ (2) Gastric stasis
Contraind: Suspected perforation
Sol: (α) Soda-bi carb solution
(β) Normal saline

(*b*) **Gastroduodenal drainage:**
Ind: (α) Alimentary obstructions: high
(β) Gastroduodenal distensions: acute
(γ) Persistent vomiting
Tech. Ryle's duodenal tube:
(*a*) Intermittent aspirations
(*b*) Continuous suction drain

(*c*) **Feeding:**
(α) Light diet:
: For about 3 days before
(β) Sterile water sips only:
: From previous evening
(γ) Nothing by mouth:
Ind: (*a*) 3 hours before operation
(*b*) Incessant vomits
(*c*) Suspected peptic perforation
(*d*) Gastroduodenal operation

(3) *Intestines:*
(*a*) **Drainage:**
(α) Evacuants: laxatives; purgatives
Contraind. Acute septic or obstructive lesion
(β) Gastroduodenal drainage
(γ) Colon irrigations
(*b*) Antiseptics:
: Bismuth, salol, carbon

(4) *Colon:*
(*a*) **Washes:**
Ind: (α) Colon and rectum lesions: chronic
(β) Rectal and colon operations
Tech: (1) High enemata
(2) High irrigations
(*b*) **Enemata:**
Ind: Every rectal and colon operation
Contraind: (*a*) Acute alimentary conditions:
(α) Perforations
(β) Obstructions
Compl: (1) Perforation
(2) Paralytic ileus
Tech: (1) **High enema:**
Ind Colon and rectum non acute lesions
Contraind Acute alimentary lesions
(2) **Low enema:**
Ind. (*a*) Every laparotomy preparation
(*b*) Diagnostic
. Two enema method in acute intestinal obstruction
(*c*) Reflex therapeutic for micturition
Contraind Any acute alimentary lesion
(3) **Glycerine syringe:**
Ind. (*a*) Children and seniles
(*b*) Fæcal impaction
(*c*) Acute alimentary lesion:
(α) Inflammatory
(β) Perforative
(γ) Obstructive
(4) **Nutrient enemata:**
Tech: (*a*) Tap water
(*b*) Saline and glucose
(*c*) Nutrient material
(*d*) Bile
Ind: (α) No oral feeding
(β) Addition to oral feeding:
(1) Shock
(2) Dehydration
(3) Cachexia

Contraind · (α) Rectal irritability or proctitis
(β) Colon and rectum operations

(5) **Medicated enemata:**
(a) Constipative
Starch and opium
(b) Sedative
Chloral, bromide, paraldehyde
(c) Decompressive
50% mag sulph solution

(5) *Biliary apparatus*
(a) **Cholagogues:** Ox bile felamine, etc
(b) **Biliary antiseptics:** Hexamine
(c) Intestinal evacuants and **carminatives:**
Carbon, bile, calomel, salines
(d) **Pancreatic extracts**
(e) **Hepatic supporters:** Glucose

(6) *Special treatment*
(a) Sera coli gasgangrene
(b) Bacteriophage intestinal

(B) *General preparation*

(1) *Hydrotherapy* Water or saline with glucose
Routes (a) Oral
(b) Rectal
(c) Subcutaneous
(d) Intravenous
(e) Intraperitoneal
Ind (1) Dehydration
(2) Acidosis
(3) Toxæmia
(4) Shock

(2) *Blood transfusion*

(C) *Other systems*

(1) **Cardiovascular system**
(2) **Respiratory system:**
Antipneumonic prophylaxis
(3) **Urinary system:**
Diuretics and urinary antiseptics

(D) *Immediate pre operative treatment*

(1) Preparation of the operative field·
(a) Clavicles to midthighs
(b) Lumbar spine if under spinal
(2) Sedative previous night
(3) Gastric wash } in indicated cases
or (3) Colon wash }
(4) Enema pre operative
(5) Catheterisation pre operative

(6) Morphine ¼ gr + atropine 1/100 gr
Half an hour before

(7) Adrenaline 1 c c if under spinal
10 minutes before

(8) Intravenous saline
Time During and after the operation
Ind (a) Shock and dehydration
(b) Spinal anæsthesia
Contraind (a) Internal hæmorrhage
(b) Cardio respiratory failure

(IV) ANÆSTHESIA

(A) *General*

(a) **Chloroform.**
Ind (1) Good relaxation
(2) Non irritant to respiratory system
Contraind (1) Cardiac depressant
(2) Hepatic poison

(b) **Ether**
Ind Stimulant
Contraind (1) No good relaxation
(2) Respiratory irritant
(3) Masks the shock

(B) *Spinal*
Ind (1) **Very good relaxation**
(2) **Prophylaxis against ileus**
Contraind (1) **Shock**
(2) Urinary trouble

(C) *Infiltration* Novocain
Tech (1) Regional subcostal and lateral
(2) Local along the incision
(3) Visceral (α) Splanchnic
(β) Infiltration
Contraind (1) Neurotic patient
(2) Local sepsis

(D) *Intravenous sodium evipan*
(1) Alone
(2) **Along with local novocain** Best

(V) CAREFUL PALPATION OF THE ABDOMEN
(a) After deep anæsthesia
\+ (b) Before the incision

(VI) TECHNIQUE OF LAPAROTOMY

(A) *Incisions*
Principles (1) Adequate access
(2) Direct access
(3) Minimum damage to anatomy

(4) Capable of extension
(5) In the lines of strain
(6) No injury to :
(a) Nerves
(b) Muscles
(7) Valvular approach

Individual : (A) *Incisions through the rectus and its sheath :*

(a) **Transverse epigastric :**

Advant : (1) No damage to nerves
(2) Easy retraction
(3) Capable of extension
(4) *No strain on suture lines*

Disadvant . (1) Length not much
(2) Unsatisfactory exposure
(3) Unsuitable for sepsis

(b) **Oblique paracostal : Kocher**
. Parallel to and 1" below costal margin

Ind . (1) Right : biliary apparatus
(2) Left (α) Spleen
(β) Proximal stomach

(c) **Vertical :**

(α) **Paramedian :**

Tech . (1) Trans rectus . rectus split
Ind . Stomies
(2) **Valvular aponeurotic :**
Ind . Physiological ideal

(β) **Median :**
Ind . Less bleeding , rapid

Contraind Incisional hernia

Sites for vertical incisions ;

(1) **Paramedian :**
(A) Supra umbilical . upper abdomen
(B) **Para-umbilical :** Middle abdomen
: General exploration
(C) Infra umbilical . lower abdomen, pelvis

(2) **Median :**
(A) **Supra-umbilical :**
: Best for emergency in upper abdomen
(B) Infra umbilical :
: Incisional hernia common

(B) *Incisions through lateral abdominal muscles :*

(a) **Oblique kidney incision :**
: (See under Kidney)

Ind : (1) Nephrectomy
(2) Ureteral exploration
(3) Lumbar ganglionectomy

(*b*) **Transverse lateral incision :**

From 2" from the outer border of erector spinæ
To Rectus sheath
Course Half way between (α) Costal margin
& (β) Iliac crest

(*c*) ***T incision :***

(1) Paramedian
\+ (2) Transverse lateral
Ind (1) *Growths of the kidney*
(2) Growths of the colon

(C) *Incisions for appendicectomies*
(See under Appendix)

(*a*) **Battle's incision :**

Adv (1) Easy and direct access
(2) Valvular
(3) Division of no important structure
Disadv (*a*) Non extensible without nerve trauma
(*b*) Secondary hæmorrhage deep epigastric
(*c*) Ventral hernia
Ind (1) Right pelvic or medial appendix
(2) *Perforated colon diverticulum*
Tech (α) Parallel with and a little internal to right semilunar line
↓ (β) *Medial displacement of rectus*

(*b*) ***Gridiron incision :***

Adv (1) Direct access
(2) *Valvular*
(3) Line of strain
(4) Extensible
Disadv (α) No general exploration
(β) Post operative inguinal hernia
Ind (1) Acutely inflamed appendix
(2) Acute abdominal catastrophe
With uncertain diagnosis
Tech (*a*) *4" long ⅓ above and ⅔rd below*
(*b*) At right angles to
(*c*) Junction of outer and mid thirds of } :
Spino umbilical line

(C) **Morison muscle cutting incision :**

Adv (α) Direct access
(β) Extensible
(γ) Good view
(δ) *Good for drainage*
Ind (α) Retrocæcal appendix
(β) *Appendicular abscess*

Tech Parallel to outer third of Poupart and iliac crest with centre opposite ant sup iliac spine

(2) *Peritoneal entrance*

Note any special condition found

(*a*) Escape of gas perforation
(*b*) Blood hæmoperitoneum
(*c*) Gastric contents gastric perforation
(*d*) Bile (α) Duodenal perforation
(β) Biliary leakage
(*e*) Intestinal contents intestinal perforation
(*f*) Urine Bladder rupture
(*g*) Fluid (1) Serous
(2) Sero sanguinous
(3) Hæmorrhagic
(4) Chylous
(5) Purulent
(6) Mucoid
(*h*) Peritoneal (1) Tubercles
(2) Fat necrosis
(3) Carcinomatosis
(4) Pseudo myxoma peritonæi

(3) *Peritoneal exploration for the focus*

(A) **Go from better to worse condition** being guided by
(*a*) Peritoneal exudate
(*b*) Intensity of peritoneal inflammation
(*c*) Distension and collapse of the intestines
(*d*) Usual sites
(α) Upper abdomen
(1) Gastro duodenal
(2) Biliary apparatus
(3) Pancreas
(4) Transverse colon
(β) Middle abdomen
(1) Ileo cæcal region
(2) Appendix
(3) Small intestines
(γ) Lower abdomen
(1) Sigmoid colon
(2) Pelvic organs tubes and ovaries

(B) Decide

(*a*) That the focus treated is really a primary focus and not a part of general manifestation of diffuse peritonitis
(α) Focus is the culmination of severity of inflammation
(β) Focus is inflamed more inside than on its surface

(b) That the focus is not secondary to other focus
Pseudo appendicitis in duodenal perforation
(c) That there is no focus additional to that which is treated

(4) *Isolation of the focal area* By abdominal packs
- (a) Count the packs
- (b) Attach artery forceps to each
- (c) Isolation from
  - (α) *General peritoneal cavity*
  - (β) Wound margins and skin

(5) *Treatment of the focus*
- (a) Excision
- (b) *Isolation short circuit*
- (c) Drainage

(6) *Peritoneal exploration for*
- (a) Complications
- (b) Associated lesions

Do not infect the uninfected parts

(7) *Peritoneal dry toilet*

(8) *Removal and counting of packs*

(9) *Closure*
- (a) Continuous medium sized catgut on round needle
  For peritoneum
- (b) Interrupted catgut on sharp needle
  For rectus sheath and muscle layers
- (c) Interrupted silk or silkworm
  For skin
- (d) Anchor stitches

(10) *Drainage*

Sites
- (a) Upto the focus
- (b) General peritoneal cavity
  - (α) **Suprapubic**
  - (β) Rutherford Morison
    Stab below tip of 11th rib
  - (γ) Paracolic gutters
    Lumbar stabs
- (c) *Intestinal drain stomy*
- (d) *Inter parietal*

Material
- (1) Rubber tube
- (2) Split rubber drain
  With wick of strip gauze
- (3) Corrugated rubber
- (4) Glove drain
  For subcutaneous spaces

Introduc.
- (a) Stab wound
- ↓ (b) Peritoneal incision

↓ (c) Introduction of tube by artery forceps
↓ (d) Anchor to the skin

(VII) AFTER-TREATMENT.

(1) *Posture:*
  (A) **Position:**
    (a) Anæsthesia:
      (α) General: recumbent on one side with head low
      (β) Spinal. (1) Trendelenburg for 2 hours:
        Contraind (a) Abdominal sepsis
          (b) Cardiac embarrass.
          (c) Abdominal distension
        ↓ (2) Recumbent for 15 minutes
        ↓ (3) Fowler
    (b) Laparotomy position.
      (α) *High Fowler:*
        Ind: (1) Perforative peritonitis
          (2) Diffuse peritonitis
          (3) Appendicular abscess
      (β) *Low Fowler.*
        Ind. (1) Unperforated appendix
          (2) Intestinal obstruction
          (3) Ectopic gestation
          (4) Twisted ovarian cyst
      + (γ) *Drained focus most dependent*
  (B) **Constant change of posture**
  (C) **Active movements of limbs:**
    : Preventive of thrombosis
  (D) Sitting up. 3 days after
  (E) Walking: 3 weeks after
  (F) Resumption of work 3 months after

(2) *Food:*
  (a) First 12 to 24 hours:
    : Water, water + glucose
  (b) Second day.
    : Equal parts of peptonised or citrated milk and barley water, weak tea.
  (c) Third day.
    : Citrated whole milk + orange or grape juice
  (d) Fourth day:
    Thin bread + butter + light-boiled eggs
  (e) Fifth day:
    : Bread + butter + milk + eggs
  (f) Sixth day:
    : Tapioca + bread + butter + milk + eggs
  (1) **Milk:** (a) Peptonised
    (b) Citrated
    (c) Diluted

(2) · **Albumen water:**

. White of 4 eggs + one pint water + lemon + sugar

(3) **Beef tea:** Not nutritive

(a) Prolonged soaking of fresh cut meat in water

+ (b) Fresh raw meat juice

(4) **Raisins tea:**

. Pour one pint of boiling water on half pound of chopped raisins

(5) **Glucose:** (a) By mouth

(b) By rectum

(c) By vein

(3) *Evacuation* '

(a) Third night liquid paraffin

(b) Fourth morning. glycerine syringe

(c) Every night liquid paraffin

(d) Alternate morning small enema

(e) Purgative not within 10 15 days

(4) *Dressings.*

(a) If aseptic

(α) Renewal of dressings 4th day

(β) Sutures out. 9th and 11th day

(b) If drainage

(α) Prophylactic peritoneal end of 48 hours

(β) Draining till it drains slow shortening

(c) Elastoplast support to the wound for 3 weeks.

(d) Abdominal belt or corset for 3 6 months

(5) *Convalescence*

(a) **Avoid straining** in any form

(1) Laborious occupation

(2) Constipation

(3) Dysuria

(4) Respiratory diseases

(5) Pregnancy

(b) Avoid friction of the wound scar

(c) Wear abdominal belt for 6 12 months

(d) Careful diet and smoking

(VIII) POST OPERATIVE CONDITIONS.

(A) *Post laparotomy symptom syndrome:*

(1) *Post laparotomy pain*

Etio: (a) Operation type protracted upper abdominal

(b) Technical errors (α) Rough handling

(β) **Tight sutures**

(γ) Irritant antiseptics

(c) **Postural errors:** (a) During operation

(β) Post operative

(d) Abdominal drains · tubes and packs

(e) **Flatulence and urinary distress**
(f) **Infection** of the wound
(g) **Hypersensitive** patient

Treat (a) Remove the etiology
(b) Direct treatment sedatives
(α) Oral (1) Aspirin grs. x
(2) Medinal grs v–x
(β) Rectal Aspirin grs xxx
Pot Bromide grs 40
Brandy ounce ½
Saline ounces 6
(γ) Subcutaneous (1) Morphia ¼ gr
(2) Omnopon

(2) *Post laparotomy thirst*

Etio (a) Abdominal operation
(b) General anæsthesia
(c) Prolonged pre operative starvation
(d) Extreme purgation }
(e) Persistent vomiting } **Dehydration**
(f) Excessive sweating }
(g) Primary morbid condition
(1) Acute gastric dilatation
(2) Gastro duodenal obstructions
(3) Paralytic ileus
(4) Acute peritonitis

Treat (A) **Oral**
Give (a) **Sips of water or fresh fruit juice**
(b) **Suck acid drops or lemon**
(c) Swab with glycerine borax
(d) Frequent mouth washes
Contraind (a) Nausea and vomiting
(b) Oral or œsophageal operations
Avoid Ice

(B) **Proctoclysis**
Tech (a) Murphy s continuous drip
(b) 6 ounces every 6 hours
Give (a) Tap water
(b) Normal saline
(c) Normal saline + 5% glucose
(d) Saline + sedatives

(C) **Venoclysis**
Give (a) Hypertonic in alkalosis and ileus
(b) Isotonic in dehydration
(c) Glucose in acidosis
(d) G – [illegible]
Contraind (1) [illegible]
(2) [illegible]

(3) *Post-laparotomy vomiting.*

Etio. (*a*) **Anæsthesia**

(*b*) General conditions:

(α) **Acidosis**

(β) Uræmia

(*c*) **Abdominal conditions:**

(α) **Acute gastric dilatation**

(β) Paralytic ileus

(γ) **Peritonitis**

(δ) **Intestinal obstruction**

Treat (*a*) Repeated oral

(α) Soda bi carb grs xxx

(β) Glucose

(γ) Adrenaline or Tr iodine

(*b*) Rectal Sodium bromide grs xxx
Chloral hydras grs xxv

(*c*) Stop everything by mouth

(*d*) Gastric wash + drain

(α) Ryle's tube

(β) Soda bi carb wash

(γ) Aspiration drainage

(3A) *Post laparotomy hæmatemesis*

Etio (1) General septic toxæmia

(*a*) Abdominal

(*b*) Peripheral

(2) **Gastro duodenal operations**

Clinic (1) Bright red and frequently repeated

(2) **Coffee-ground** at intervals

Diff diag (1) Gastric source

(2) Gastric accumulation from

(*a*) Oral cavity

(*b*) Pharynx

(*c*) Respiratory passages

Treat: (1) **Ice:** To suck and on epigastrium

(2) **Adrenaline:** M x every 30 minutes

(3) **Morphia:** ⅙ to ¼ grain

(4) Treat the shock

(5) **General coagulants**

(6) Blood transfusion

(7) **Gastric lavage:** With tepid soda-bi carb sol

(4) *Post laparotomy flatulence*

Etio (*a*) Pre operative chronic dyspepsia fermentation

(*b*) Lack of bile

(*c*) Obstructive focus

(*d*) **Administration of glucose and milk**

(*e*) **Inability to strain**

(*f*) Rough handling or visceral exposure
(*g*) **Saline purges**

Clinic: Distension + tympanitis

Treat: (*a*) **Gastric aspiration: Ryle**
(*b*) Carminatives and absorbents: carbon
(*c*) Flatus tube
(*d*) Turpentine stupes and enema:
: Turpentine ounce one
+ Water . pints two
(*e*) Repeated small doses of morphia
(*f*) Pituitrin or pitressin
(*g*) Eserine salicylate 1/100 gr.
(*h*) **Avoid milk, glucose, saline purges**

(5) *Post laparotomy hiccup:*

Etio: (A) **Diaphragmatic irritation** due to
(*a*) Basal thoracic focus
(*b*) Upper abdominal focus
(*c*) **Peritonitis**
(B) **Uræmia**

Treat: (*a*) Propped up or **sitting posture**
(*b*) **CO_2 inhalations**
(*c*) Carminative sedative
(α) Ol cajuputi m 1
(β) Tr. Belladonna
(γ) Atropine
(*d*) Phrenic alcohol injection

(6) *Post-laparotomy retention of urine.*

Def: (*a*) Absence of urination for 18–24 hours
or (*b*) Complaint of inability to pass urine
or (*c*) Bladder 3 finger-breadth above symphysis
or (*d*) Undue frequency without control

Etio: (*a*) Age any, young adults, seniles
(*b*) Sex: females
(*c*) Temperament. hypersensitive
(*d*) Change of environment and posture
(*e*) Dehydration
(*f*) Anæsthesia: (α) Spinal
(β) Prolonged ether
(*g*) Operations: (α) Abdominal
(β) Pelvic
(*h*) Narcosis: morphia

Treat: (*a*) **Postural** and psychic treatment:
: Sitting posture + firm abdominal binder
+ isolation
(*b*) Hot bottle or stupes to hypogastrium
(*c*) **Hot water enema**
(*d*) Plenty of fluids by all available routes

(e) Drugs:
- (1) Oral: (a) Hexamine grs. xv
  - (b) Piperazin grs. x
    Pot citras grs x
    Pot. acetas grs x
    Inf. buchu ad ounce i
    : Six hourly
  - (c) Pot acetas drachm i in milk·
    . Every two hours
  - (d) Carbachol or Moryl tablets
- (2) *Injections:*
  - (a) Pilocarpine 1/12 gr.
  - (b) Acetylcholin ·5 gm.
  - (c) Pituitrin 1 c c
  - (d) **Doryl or Moryl 1 c.c.**
  - (e) Uritone one ampoule
  - (f) Hexamine intravenous
    10 grs in 20 c c. sterile water
  - (g) Glucose· intravenous

↓ (f) **Aseptic catheterisation:**
With administration of urinary antiseptics

(B) *Post-laparotomy peritoneal conditions:*
- (1) *Post operative peritonitis and residual abscesses:*
  . (See under Peritonitis)
- (2) *Post operative intestinal obstruction:*
  - (A) **Immediate:**
    - (a) Mechanical (α) Focus left untreated
      (β) Technical mistake
    - (b) **Paralytic ileus:** (See under Intestines)
  - (B) **Intermediate:** After 3 weeks
    Due to inflammatory adhesions
  - (C) **Late:** After 3 months to years
    - (a) Due to fibrosis (α) Stenosis
      (β) Adhesions
    - (b) Due to obstructed ventral hernia
- (3) *Post operative acute gastric dilatation·*
  (See under Stomach)

(C) *Post-laparotomy local complications:*
- (1) *Post operative sepsis of the incision:*

Etio: (a) **Laxity in asepsis:**
- (α) Surgeon and his assistants
- (β) Preparation of the operation area
- (γ) Instruments and apparel
- (δ) Mouth and nose sepsis
- (ε) Dressings

(b) **Technical errors:**
- (α) Rough handling

(β) Inadequate wound protection.
 (1) Skin protection
 (2) Margins protection
 (3) Viscera protection
 (4) General peritoneal cavity protection
 (5) Post operative wound protection
(γ) Imperfect hæmostasis
(δ) Unsuitable ligatures and sutures
 (1) Unabsorbable ligatures
 (2) Ligature en masse
 (3) Tight sutures
 (4) Septic or exposed suture material
(ε) Same scalpel for skin and deeper tissues
(ζ) No parietal drain in septic cases

(c) **Nature of operations:**
 (α) Septic conditions
 (β) Open trauma
 (γ) Intestines and colon
  Obstructions

(d) **Lack of resistance to infection:**
 In the patient

...nical types (a) **Stitch abscess.**
Etio Septic ligature
Clinic (1) Tender spot
↓ (2) Soft spot
↓ (3) Sinus if non absorbable
Compl Non healing sinus
Treat (1) Fomentations
↓ (2) Drainage
+ (3) Removal of the stitch

(b) **Margin infection:**
Clinic (1) Tender, red margins
(2) Gap between margins under epithelium
(3) Non union of margins
Treat (1) Introduction of probe
 To drain accumulated serum
(2) *Removal of a stitch*

(c) **Peri-wound abscess:**
Etio (1) Infected ligature or suture
(2) Infected hæmatoma
(3) Liquefaction of fat
Clinic Signs of abscess
Treat. (1) Conservative:
 (α) Local: fomentations
 (β) General: sulphonamides
(2) Operative
 (α) Removal of sutures
 (β) Incision and drainage

(d) Abdominal wall cellulitis :

Etio : (1) Simple : pyococcal
(2) Secondary : intestinal sepsis
: peritoneal sepsis

Clinic : Spreading cellulitis

Treat : (1) Prophylactic :
. Interparietal drain in every septic laparotomy : actual or potential
(2) Therapeutic :
(α) General : sulphonamides
(β) Local . drainage

(e) Diffuse gangrene of the abdominal wall :

Etio . (1) Septic
(2) Specific . anærobic
(3) Idiopathic

Clinic Diffuse rapid sloughing of abdominal wall with exposure of peritoneum and intra-peritoneal viscera in the wound

Compl · (a) Burst abdomen
(b) Ventral hernia

Treat . (1) General antispecific
(2) Local (α) Excision
(β) Application of cautery or fuming acid round about
(γ) Zinc peroxide (Melenez)

(f) Digestive dermatitis :

Etio : (1) Stomies (α) Gastro—
(β) Entero—
(γ) Cholecysto—
(2) Fistulæ (α) Gastric
(β) Duodenal
(γ) Biliary

Clinic . Irritative → ulcerative dermatitis :
· Round about a fistula

Treat . (1) Emollient dressings
(2) Antichemical applications :
(α) Soda-bi carb or egg white :
. In gastric juice
(β) Citric acid in bile
(3) Suction drainage

(g) Persistent sinus :

Etio : (1) Retained foreign body or sepsis ·
(α) Septic ligature
(β) Swab or sponge
(γ) Drainage tube
(2) Communication with viscera

(3) Specific:
(α) Tuberculosis
(β) Actinomycosis
(γ) Regional enteritis
(δ) Malignancy
Treat: (1) Treat the etiology
(2) Scraping or excision

(h) **Secondary hæmorrhage:**
Etio: (1) Suppurative myositis
(2) Pressure of drainage tube
Site. Battle's incision deep inf. epigastric art

(2) *Post operative fæcal fistula*: (See under Intestines)
Etio: (a) Drainage tube pressure
(b) Leakage from anastomosis
(c) Local trauma or gangrene
(d) Specific infection tuberculosis
(e) Carcinoma
(f) Internal intestinal fistula
(α) Bursting stump
(β) Leaking anastomosis
(γ) Premature stimulation of peristalsis:
: Hasty enema
(g) Drainage of local perforative abscesses
Clinic. Discharge of fæculent or fæcal material
Morb. anat: (a) Lined by granulations
(b) Lined by mucous membrane
Compl: Skin irritation
Treat: (A) **Conservative:**
(a) Diet:
· Semi starvation with restricted fluids
(b) Medicines.
(α) Bismuth oxycarb: 30 grs. six hourly
(β) Pulv-cretæ aromat: ʒi four hourly
(c) Enemata and bowel washes:
: Every morning
(d) Irrigations: with hydrogen peroxide
(e) Dressings: skin protection
(α) Horse serum
(β) Zinc castor oil
(γ) Mercury subchloride:
: 30% in lanoline
↓ (B) **Love's obturator method**
↓ (C) **Operative:** (See under Intestines)
Sequelæ. (1) Adhesions
(2) Ventral hernia

(3) *Post-operative burst-abdomen:*
Predisp: (a) **General debility and diseases**

(b) **Nature of the condition:**
- (1) Biliary diseases with jaundice
- (2) Visceral carcinoma
- (3) Suppurative peritonitis
- (4) Acute pancreatitis
- (5) Ascites

(c) **Operative technique:**
- (1) Upper abdomen incision
- (2) Magnitude of incision
- (3) Viscera operated upon
  - (α) Stomach
  - (β) Duodenum
  - (γ) Gall bladder
  - (δ) Pancreas
  - (ε) Spleen
- (4) Septic contamination of the wound
- (5) Necessity for drainage

Exciting (a) **Errors in operative technique:**
- (1) Type of incision non valvular
- (2) Damage to the wound margins
- (3) Prematurely absorbable sutures
- (4) **Continuous suture in parietes**
- (5) **Insinuation of omentum:**
  : **Between the edges of peritoneum**

(b) **Occurrence of certain post-oper. compl.:**
- (α) **Undue strain:** Due to
  - (1) Imperfect anæsthesia
  - (2) Pulmonary complications
  - (3) Persistent vomiting
  - (4) Persistent hiccup
  - (5) Constipation
  - (6) Dysuria
  - (7) Delirium
  - (8) Repeated passage of gastric tube
    Retching and straining
- (β) **Infection of the wound**
- (γ) **Action of the ferments:**
  - (1) Stomach
  - (2) Duodenum
  - (3) Biliary passages
  - (4) **Pancreas**

Types. (a) **Acute total:**
: Rapid through and through
With prolapse of the intestines

(b) **Interno-external:**
Path · Internal failure of sutures
· Only skin and subcut. tissues intact

Clinic : (α) Soft gap between margins
(β) Peristalsis visible through the skin

(c) **Externo-internal :**

Path : Non union or tearing of superficial wound
: Granulation lined (α) Peritoneum
Or (β) Intestinal coils

Clinic : Granulation lined red mass seen between the widely separated wound margins

Clinic : (1) Prolapse of the intestines . total
(2) Subcutaneous intestines : interno external
(3) Partial bursting of the wound . with
(a) Pink blood stained exudate
(b) Fleshy, plum coloured mass

Time . 7th to 9th post-operative day

Treat : (A) **Prophylactic :**

(a) Avoidance of undue trauma
(b) **Complete hæmostasis**
(c) Accurate coaptation
(d) Complete relaxation of abdominal wall
(e) Obliteration of dead spaces
(f) **Complete asepsis**
(g) **Supporting sutures**
(h) **Avoidance of straining**
(i) **Interrupted sutures in parietes**
(j) **Careful coaptation of peritoneum**
(k) **Avoid through & through sutures**
(l) **Valvular approach**

(B) **Therapeutic :**

(a) **Resuture :**

(1) Cover with warm saline pads
(2) Morphia or omnopon
: With scopalamine
(3) Avoidance of straining
(4) Anæsthesia
(5) Reduction of the prolapse :
: After toilet if necessary
(6) Resuture the wound :
(a) Through and through silk
(b) Interrupted mattress 20d. catgut
(c) Silver wire method

(b) **Tampon ;**

Ind : (1) Bad general health
(2) Foul suppurating wound
(3) Localised rupture
(4) Purulent peritonitis

Tech (1) Replace the protrusion
(2) Pack the wound
Gauze in paraffin and flavine
(3) Elastoplast dressings
Every third day

After treat Abdominal corset

Sequelæ (1) Ventral hernia
(2) Adhesions

(D) *Post laparotomy general complications*

(1) *Post operative shock*
(See under Shock)

Varieties (*a*) **Nervous** or mental shock morphia
(*b*) **Traumatic** shock
Delicate handling
(*c*) **Dehydration** shock
Fluids
(*d*) **Toxic** shock
Treat the toxæmia
(*e*) **Peritonism**
(*f*) **Splanchnic shock**
Prophylactic block

(2) *Post operative toxæmia*
(See under Peritonitis)

(3) *Post operative acidosis*

Etio (*a*) Children
(*b*) Diabetes
(*c*) Inefficient liver
(*d*) Prolonged general anæsthesia

Clinic (1) Shock circulatory failure
(2) Vomiting
Persisting for more than 48 hours
(3) New mown hay breath
(4) Rothera's test for acetone

Treat (A) Glucose
(*a*) Rectal 8 ounces of 10% glucose
In saline four hourly
(*b*) Subcutaneous 5% glucose
(*c*) Intravenous 5% glucose in saline
+ (B) Insulin
(C) Soda bi-carb

(E) *Post laparotomy respiratory complications*
(See under Respiratory System)

(1) **Post-operative pneumonia**

Etio (*a*) Operation during respiratory infection
(*b*) Exposure under shock
(*c*) General anæsthesia ether

(d) Hypostasis
(e) Deficient aeration abdominal wound
(f) Embolic septicæmic
(g) Toxic
(h) Too much venoclysis
(i) Aspiration vomit under general anæsthesia

Prophylax (a) Avoidance of operation in resp infections
(b) No exposure
(c) Avoidance of prolonged anæsthesia
(α) Cyanosis
(β) Ether
(d) Frequent changes in posture
(e) Breathing exercises
With antiseptic and stimulant inhalations
(f) Prevention of embolism and toxæmia
(g) No venoclysis in cardio vascular disease
(h) Pre anæsthetic stomach wash or drain
(i) Measures
(α) Turpentine stupes to the chest
(β) Injections A S A
Camphor in oil
Transpulmin
(γ) Mist. expectorans

(2) *Other lung complications*
(A) Collapse of the lung
(B) Œdema of the lung
(C) Pulmonary embolism

(Γ) *Post laparotomy distant complications*

(1) *Post operative acute suppurative parotitis.*
(See under Parotid)

Etio (a) Dryness of the mouth
(α) Dehydration
(β) Atropine
(b) Oral sepsis
(c) Oral inactivity nothing by mouth
(d) Septic abdominal lesions
(e) General toxæmia

Time 3 to 10 days after operation

Clinic Acute parotitis

Treat (1) Oral hygiene
(a) Attention to septic foci
(b) Gargles
(c) **Sialagogues:** Lemon to the tongue
(2) Fomentations and antiphlogistin
(3) **Incision + drainage:**
Ind No subsidence till 5th day
Inspite of conservative measures

(a) Rapid increase in swelling
(b) Inflammatory œdema
(c) High temperature

Tech (a) Incision 1" parallel to facial nerve
↓ Hilton s method
(b) Blair s method

(2) *Post operative thrombophlebitis*

Etio (a) Age over 40
(b) Obesity
(c) Sepsis
(d) Previous phlebitis
(e) Varicose veins
(f) Operations (1) Splenectomy
(2) Cæsarean section
(3) Cholecystectomy
(4) Prostatectomy
(5) Appendicectomy
(6) Herniotomy
(g) Fowler s position with
Knee pillow or air cushion

Clinic (a) Pain along the vein
(b) Tender cord like swelling
(c) Cyanosed and œdematous limb
(d) Pyrexia
(e) Leucocytosis

Compl (1) **Pulmonary embolism**
(2) Elephantoid **œdematous leg**
(3) Eczema and ulceration
(4) Recurrent phlebitis

Prophylax (a) **Free movements of the limbs**
(b) **Exercises**
(α) Breathe deep
(β) Spit hard
(γ) Wave legs and arms
(c) Thyroid extract
(d) Pre operative proximal elastoplast
If varicose veins
(e) Injections
Atropine 1/100 gr + Ephetonine ½ gr
Three injections on alternate days
From fifth post operative day

Treat (See page 146)
(a) Posture flat on back
(b) Sedatives for pain
(c) Immobilisation and support

(α) Splint: for 3 weeks
↓ (β) Elastoplast: for 3 months
↓ (γ) Elastic stockings: for 6 months

(3) *Post-operative bedsores:*

Etio: (a) General debility
(b) Toxæmia
(c) Local devitalisation
(d) Pressure + dirt + moisture
(e) Spinal cord or nerve lesions

Sites: Bony prominences: sacrum, trochanters, etc.

Clinic: (See page 31)

Treat. (See page 32)
(a) Efficient nursing
(b) Relief of pressure
(α) Change of posture
(β) Air cushion
(γ) Elastoplast
(c) Dryness and cleanliness:
(α) Frequent attention
(β) Drainage of discharges
(γ) Talcum or bismuth sub gallate
(d) Applications Absolute alcohol
Tannin
. Formalin 1%
Friars' balsam
. Collodion
. Mastisol
. Whitehead's varnish
(e) Surgical procedures.
(α) Removal of sloughs
↓ Eusol or hydrogen peroxide
(β) Skin grafting
(γ) Sympathectomy

(G) *Sequelæ of abdominal operations*

(1) **Local:** (a) Scar irregularities
(b) Incisional or ventral hernia

(2) **Abdominal:** (a) Adhesive intestinal obstruction
(b) Post operative constipation

(3) Abdominal **neurosis:** dyspepsia

(IX) IMPORTANT POINTS

(1) Gauze as a drainage material is unsound, it soaks up pus or blood, which dries up, acts as a plug and hinders drainage; it also sticks to internal viscera and causes damage at the time of removal

(a) Rapid increase in swelling
(b) Inflammatory œdema
(c) High temperature

Tech (a) Incision 1" parallel to facial nerve
↓ Hilton's method
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(*d*) Pressure + dirt + moisture
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Sites Bony prominences sacrum, trochanters, etc

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(*d*) Applications Absolute alcohol
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Formalin 1%
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(*e*) *Surgical procedures*
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(*b*) Post operative constipation

(3) Abdominal **neurosis**: dyspepsia

(IX) IMPORTANT POINTS

(1) Gauze as a drainage material is unsound, it soaks up pus or blood, which dries up acts as a plug and hinders drainage, it also sticks to internal viscera and causes damage at the time of removal

(2) A correct pre operative diagnosis is the hand maiden of a successful laparotomy.

(3) Silk suture is better for parietes, provided asepsis is assured

(4) *A suprapubic drainage tube must project above the skin level for about half an inch*

(5) *Never use any swab in the abdominal cavity unless it is taped and the tape secured by artery forceps*

(6) *Never forget to count the swabs before commencing the peritoneal suture*

(7) Abdominal pain below the age of 5:
- (a) Worms
- (b) Intussusception
- (c) Ileo colitis
- (d) Henoch's purpura

(8) Abdominal pain in children above 5
- (a) Worms
- (b) Appendicitis
- (c) Inflamed mesenteric glands
- (d) Abdominal tuberculosis
- (e) Pneumococcal peritonitis
- (f) Pneumonia
- (g) Influenza
- (h) Spinal disease
- (i) Muscular strain

(9) *No aperient should ever be given in a case of acute abdominal pain*, if there is a least suspicion of a local inflammatory lesion

(10) *Best incisions for general exploration of the abdomen:*
- (a) *Supra umbilical median*
- (b) *Para or infra umbilical paramedian.*

(11) Pure milk gives rise to flatulence.

(12) *Beware of laparotomy in*
- (a) *Laborious workers*
- (b) *Child bearing aged females*

As it is a predisposer of ventral hernia.

(13) *It is far better to enlarge a laparotomy incision than to pull and drag* on an intraperitoneal viscus through a cramped space

(14) *Never forget to palpate the whole of the abdomen thoroughly after the patient is under and before the actual operation begins.*

(15) *Common complications of intraperitoneal drainage tube:*
- (a) *Paralytic ileus*
- (b) *Fæcal fistula*
- (c) Secondary hæmorrhage
- (d) *Ventral hernia*
- (e) *Adhesions*

(16) Tilting the patient in such a way as to favour internal drainage of infected peritoneal fluid into the pelvis—Fowler position—is the greatest advance in surgery since Lister days

(17) *Take care to see that a peritoneal drainage is always dependant*, if not, adjust the posture likewise

(18) *Take greatest care to see that*

(a) *The patient is never turned on his sound side in a localised peritonitis*

(b) *The sterile parts of peritoneal cavity are not contaminated by exploration after dealing with a septic primary focus*

(c) *No complication of the primary focus treated at the laparotomy, is overlooked*

(19) Unless there are contraindications, patient should be encouraged to use his arms move his legs and alter his position in bed as often as he may feel inclined

(20) Fowler s position relieves post operative pains

(21) Adjust the bandages shortly after the patient comes fully round from the anæsthesia

(22) *Avoid ice after a laparotomy*, it is a precursor of gastric paralysis.

(23) When called to see a patient with post operative distended abdomen, remember full bladder

(24) 75% of all cases that require catheterisation develop cystitis

(25) *Fat patients with short necks are the worst enemies of surgery* on account of

(a) Heart failure
(b) Post-operative pneumonia

(26) Post operative alimentary paralytic syndrome

(a) Acute gastric dilatation
(b) Paralytic ileus

(27) Causes of post operative alimentary paralytic syndrome

(a) Continuation of pre operative condition
(b) Trauma rough handling and exposure
(c) Toxæmia peritonitis
(d) Reflex
(e) Obstruction + lack of propulsive power

(28) *For every laparotomy, clavicles to mid thighs must be prepared*

(29) In general peritonitis

(a) Drain the infected focus
(b) Drain the peritoneal pouches
(c) Drain the muscular and subcutaneous planes of the wound

(30) In the treatment of a septic focus in peritoneal cavity, take good care to isolate it from general peritoneal cavity before its treatment Do not, on any account, contaminate the sterile parts of the general peritoneal cavity either by gravity or by direct touch at the time of exploration

(31) In all cases where frequent applications of hot fomentations to the skin are required, protect the skin with thick coating of zinc and castor oil ointment

(32) Differential diagnosis is difficult between
- (a) Fæcal fistula
- (b) Discharging hæmatoma
  Infected by B coli

(33) *80% of all fæcal fistulæ are due to cæcal sloughing after operations on gangrenous appendix*

(34) A fæcal fistula will not close spontaneously if the mucous *membrane of the gut is continuous with the skin*

(35) Hypertonic and constant intravenous drip are most likely to produce phlebitis

(36) Liability to phlebitis is one of the contraindications for operations of choice

(37) *Fowler's position is a great predisposer of phlebitis*, patients should at least be allowed to lie down to sleep at night

(38) If abdomen has been opened in an unsuitable place, there are two alternatives
- (a) Extension of exploratory incision
- (b) Closure of the exploratory incision
  ↓ Fresh directly overlying incision

(39) Three kinds or stages of exploratory incisions
- (a) Small diagnostic incision
- ↓ (b) Medium therapeutic incision
- ↓ (c) Large, extended incision for extra exposure.

(40) An intra abdominal lesion associated with toxæmia, anæmia and cachexia, predisposes to burst abdomen

(41) Burst abdomen occurs with equal frequency after local, spinal and inhalation anæsthesia.

(42) *Most common causes of burst abdomen*
- (1) e of suture
- (2)
- (3)
- (4) *Sepsis*
- (5) *Digestive ferments*

(43) Characteristic of perforated peptic ulcer, is the 'instanter' onset.

(44) *Best preventer of burst abdomen is a valvular incision*

(45) *Difficulties in suturing an abdominal wall.*
- (a) *Rigid abdomen*
- (b) *Retraction of peritoneum*
- (c) *Very thin peritoneum*
- (d) *Evisceration* due to straining
- (e) *Sutures giving way*
- (f) *Injury to intestines*

(46) Peritoneal incision and suture rules
- (a) Raise the peritoneal edges
- (b) Incise and suture in full inspiration
- (c) Hold the scalpel horizontal
- (d) Be sure that nothing lies against the peritoneum
- (e) Take care not to prick the intestines by the needle.

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(1) *Insinuation of omentum*
Between peritoneal edges at the time of suture
(2) Intermittent and *sudden strain*
(3) Rapidly absorbable sutures
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GENITO-URINARY SYSTEM

CHAPTER I

URINARY EXAMINATION AND ABNORMALITIES

(A) URINARY EXAMINATION

(1) CHEMISTRY, CYTOLOGY & BACTERIOLOGY

(2) URETHROSCOPY

- (A) **Anterior**
- (B) **Posterior**

(3) CYSTOSCOPY

Ind (A) **Diagnostic:**

- (a) Bladder conditions (stone, growth, cystitis, prostate, diverticulum, etc.)
  - (α) Air bubble fundus
  - (β) 4 and 8 o'clock ureteral openings
- (b) Ureteral conditions (calculus, T B, etc)
- (c) Kidney conditions

(B) **Therapeutic:**

- (a) Bladder conditions. fulguration
- (b) Ureteral conditions ureteral stone
- (c) Kidney conditions pelvic lavage

Tech (A) **Simple cystoscopy**

(B) **Chromo-cystoscopy:**

Routes (a) Intramuscular
(b) Intravenous

Solutions (a) Indigo carmine 4 c.cs of 0 4%
(b) Phenol sulphone phthalein
(c) Methylene blue 1–2 c.cs

Results (a) Time of appearance
- (α) 5–7 minutes after intravenous
- *(β) 15–20 minutes after intramuscular*

(b) Depth of the colour

(4) URETERAL CATHETERISATION

Ind
- (a) Patency test
- (b) Collection of kidney urine
- (c) Renal lavage or instillations
- (d) Opaque catheter → X Ray
- (e) Instrumental pyelography
- (f) Instrumental treat. of ureteral stone or stricture

Catheters (1) Material gum elastic
(2) Length. 30 inches

(3) Size Charriere 4–16
(4) Types (*a*) Olivary
(*b*) Whistle tip
(5) Marks alternate dark and light areas of 1 cm rings every 5 cms
(6) Kinds (*a*) Opaque
(*b*) Non opaque

Guides (*a*) Inter ureteric bar
(*b*) Ureteric openings
4 and 8 o clock of the cystoscopic disc

(5) X RAY

(A) **Plain X Ray**

Ind (*a*) Lumbar pain
(*b*) Renal colic
(*c*) Kidney swelling
(*d*) **Suspected calculus**

Planes (1) Antero posterior
(2) Lateral

(B) **X Ray with opaque ureteric catheter**

Ind Suspected ureteric stone

(C) **Pyelography**

(1) *Descending or intravenous*

Preparation (*a*) Enema night before
(*b*) Enema 30 min before
(*c*) Intramuscular pitressin 5 c cs
(α) One hour before
(β) Half an hour before

Inj 20 c cs of warm sterile sol of uroselectan B
Into median basilic vein
(8 c cs. in infants 12 c.cs in children)

Points (*a*) **Avoid leakage outside the vein**
(*b*) Injection rate 10 c cs a minute
(*c*) Use large bored needle
(*d*) Inject few c cs of saline at the end
To prevent thrombosis

X Ray (A) *Time*
(*a*) 5 minutes
(*b*) 15 minutes
(*c*) 30 minutes
(*d*) 45 minutes
(*e*) 90 minutes
(*f*) 150 minutes

(B) *Position*
(*a*) Trendelenburg with abdominal compress
(*b*) Standing in mobile kidney

(2) *Ascending or instrumental*

Ind Renal growths, hydronephrosis, calculus, etc

Contraind (a) Acute urinary tract inflammations
(b) Urinary tract obstructions
(c) Chronic urinary tract inflammations
Tuberculosis
(d) Uræmia

Anæsth Urethral cocain bicarbonate

Position Lithotomy

Tech (a) Pass the cystoscope
↓ (b) Wash out and distend the bladder
↓ (c) Pass No 5 Charriere ureteric catheter
↓ (d) Withdrawal of cystoscope
↓ (e) Plain X Ray plate
↓ (f) Aspiration of pelvic contents
↓ (g) Injection of warm sterile solution of
12% sodium iodide or 20% sod bromid
Till discomfort in the loin
(Normal quantity 7 c cs)
↓ (h) X Ray plate
↓ (i) Aspiration of solution
↓ (j) Third X Ray plate

Methods (1) Injection
(2) Gravity raise the solution receptacl
feet above the patient

Varieties (a) Pyelogram
(b) Ureterogram
(c) Cystogram

Normal pyelogram (Uniform density & razor sharp margins)

(1) *Pelvis* (a) Trumpet shaped
(b) Upper edge f shaped
(c) *Lower edge semicircle*
(d) *No bulging on inner aspect* of pelvis beyond ure

(2) Calyces (a) Major three (*upper in line of ureter*)
(b) Minor six to nine
(c) *Cup-shaped*

(3) *Positions*
(a) Pelvi ureteral junction
Opposite transverse process of 2 L
(b) Calyces
(α) Upto 11th rib above
(β) Upto transverse process of 3 L below

Abnormal pyelogram

(1) *Pelvis*
(a) Alteration in size back pressure
(b) Alteration in shape back pressure
new growth

(d) Alteration in density T B, calculus
(e) Alteration in pelvi-ureteral junction
(f) Duplication

(2) *Calyces*
(a) Changes in outline clubbing
In back pressure
(b) Changes in size
In back pressure
(c) Changes in density mottling or fluffiness
In T B
(d) Changes in shape
In new growths or polycystic kidney
(e) Obliteration of plain X Ray shadow
Stone
(f) Changes in position
Mobility or congenital misplacements

(3) *Ureter*
(a) Changes in size hydro-ureter
stricture ureter
(b) Changes in outline T B ureter
(c) Changes in course mobile kidney
(d) Changes in number double ureter

Dangers and difficulties of pyelogram

(A) Intravenous
Tissue necrosis due to perivenous escape
(B) Retrograde
Renal trauma
(C) Both
(α) Uncontrollable colitis
(β) Iodism

(6) RENAL FUNCTION TESTS

(A) Clinical features of uræmia:

(a) Nervous **headache, drowsiness, convulsions**
(b) Respiratory dyspnœa
(c) Gastro intestinal (α) **Thirst**
(β) **Vomiting**
(γ) ***Parrot dry tongue***
(δ) Dyspepsia
(ε) **Tympanitis**
(d) Urinary (α) Polyuria
(β) **Oliguria**
(γ) **Anuria**

(B) Examination of the urine:

(a) Quantity (α) Polyuria
(β) **Oliguria**
(γ) Anuria
(b) Specific gravity high or low

(c) Chemical exam **urea content**
sugar
albumin

(d) Microscopical exam **renal casts**

(C) **Renal tests :**
- (a) **Chromocystoscopy :** (See above)
- (b) **Intravenous pyelography** (See above)
- (c) Ureteral catheterisation
  - (α) Urine from each renal pelvis
  - (β) Ascending pyelography

(D) **Elimination or retention tests :**
- (a) **Urine ·**
  - (1) **Urea concentration test :** (Maclean's)
    No fluids for 12 hours
    ↓ 15 gms of urea in 100 c cs of water by mouth
    ↓ Collect the urine every hour for three hours
    Normal % of urea in 2nd and 3rd hours > *2*
  - (2) Urea split function test
    Urea 15 gms. in 100 c.cs of water by mouth
    ↓ Ureteral catheterisation
    ↓ Withdrawal of urine from each kidney
    After 1½ hour
    ↓ Estimation of urea
  - (3) Urine diastase test
- (b) **Blood ·** (Urea and N P N)
  Blood urea test
  Withdrawal of 5 c cs of blood
  ↓ Injection into a test tube containing ca oxalate
  ↓ Estimation of urea
  Normal blood urea 20–40 mgms per 100 c cs

(B) URINARY ABNORMALITIES

(I) POLYURIA

Etio
- (a) **Chronic interstitial nephritis**
- (b) **Diabetes**
- (c) Diuretics and hydrotherapy
- (d) Changes in weather and climate
- (e) Nervous

(II) OLIGURIA AND ANURIA

Def
- (A) Oliguria diminished secretion of urine
- (B) Anuria total suppression of urine

Etio
- (A) **Hysterical** anuria
  Temporary, no uræmia
- (B) **Blood pressure** anuria
  Shock

(C) **Dehydration** anuria

Etio (α) Pronounced vomiting
(β) Pronounced diarrhœa
(γ) Pronounced perspiration

(D) **Reflex anuria:**

(a) *Urethral instrumentations*
(b) Bladder operations
(c) Ureter impacted stone
(d) Kidney acute inflammation

(E) **Back-pressure** anuria

(1) **Urinary obstruction:**
(a) Gradual enlarged prostate
(b) Sudden calculus anuria
(2) **Sudden decompression:**
After prolonged acute retention

(F) **Destruction** anuria Renal failure
(1) Gradual hydro or pyo nephrosis
(2) Sudden removal of only functioning kidney

(G) **Infective** anuria
(1)

(2) **Ascending urinary**
(a) **Primary:**
Urethritis → cystitis → pyelitis
(b) **Post operative:**
Operations or instrumentations on acute or chronic urinary sepsis

Path (A) **Pre renal anuria:**
Circulatory causes

(B) **Renal anuria:**
(a) Renal destruction or removal
(b) Renal sepsis
(c) Renal inhibition

(C) **Post renal anuria:**
(a) Obstruction
(b) Infection
(c) Irritation
(d) Trauma
} of lower urinary passages

Diff diag (1) **From retention of urine.**
(a) No palpable bladder or peri vesical cellulitis
(b) Catheterisation easy + no urine
(c) Urinary toxæmia

(2) **From rupture bladder:**
(a) No history of trauma

(b) No extravasation of urine:
(α) Peritoneal
(β) Extraperitoneal
(3) **From recently evacuated bladder:**
: History

Treat. (A) *Medical*.
(a) **Diuretics:**
(α) **Fluids:** (1) Mouth
(2) Rectum
(3) Subcutaneous
(4) Intravenous
(β) **Oro-therapy**
(γ) **Intravenous:**
(1) **Isotonic sodium sulphate:**
42 85 gms of Glauber's salt in 1 litre of water
(2) Glucose 20%, 25 c.cs.
(3) Saline
(b) **Evacuants:**
(α) Purges saline
(β) Sudorifics pilocarpine
(c) **Local:** Hot packs, cupping to loins

(B) *Surgical*.
(a) **Removal of etiology:**
(α) Obstruction
(β) Sudden decompression
(b) **Continuous gradual drainage:**
(α) Indwelling catheter urethral or ureteric
(β) Suprapubic cystostomy
(γ) Nephrostomy

Compl **Uræmia:**
Treat **Re establishment of urinary flow:**
(1) **Urinary drainage:**
(α) Urethral catheter
(β) Cystostomy
(γ) Ureteral catheter
(δ) Nephrostomy
(2) **Hydrotherapy:**
(α) Oral
(β) Rectal
(γ) Subcutaneous
(δ) Intravenous
(3) **Diuretics:**
(a) Oral: Pot. citras grs. x
Pot. acetas grs. x
Spt. aeth nitrosi m xxx
Inf. buchu ounce i

(b) Intravenous
(α) Glucose saline
(β) Sodium sulphate isotonic

(4) **Purgatives** Salines

(5) Diaphoresis (a) Pilocarpine 1/60 gr
(b) Hot packs

(6) **Local** Cupping

(7) **Surgical measures**
(A) **Peritoneal lavage** Repeated
Tech (a) Pass a catheter in upper peritoneum
(b) Run in saline
(c) Pass a catheter above the pubes
(d) Drain
(B) **Renal decapsulation**
Or (C) **Nephrostomy** + intravenous sod sulph

(III) BACILLURIA

Def **Presence of bacilli** in urine **with latent inflammation** of the urinary tract

Etio (1) **Hæmatogenous** Descending
(2) **Ascending** From lower urinary tract
(3) **Migration** Local invasion from neighbours
B coli from intestines

Bact (A) **Acid urine**
(a) B coli
(b) Gonococcus
(c) B Typhosus
(d) T B
(B) **Alkaline urine** Urea splitting organisms
(a) B proteus
(b) Staphylococcus
(c) B pyocyaneus

Clinic (A) Cloudy fishy urine
(B) Reaction (a) Acid coli bacilluria
(b) Alkaline urea splitting organisms
(C) Urinary irritation
(a) Burning micturition
(b) Enuresis
(D) Signs
(a) Microscopical examination
(b) Cultural examination

Compl Ascending or descending urinary sepsis

Treat (1) **Diuretics**
(a) Fluids
(b) Oral medication dry cal chloride
(c) Intravenous sodium sulphate
(2) **Urinary chemical opponents**

(A) *For acid urine* *Alkalies + antispasmodics*

(a) **Pot. citras** grs 60
in water ounce ½ + syrup of oranges
Dose 2 hourly for 8 hours
↓ 4 hourly for 36 hours

(b) Soda bi carb

(B) *For alkaline urine* *Acidifiers + hexamine*

(a) Acid sodium phosphate

(b) **Acid ammonium phosphate.**
2 grams T D S

(c) Nitrohydrochloric acid
℞ acid nitrohydrochlor fortis ziv
Aqua destillata ounces iv
Dose zi in a glass of water after meals

(d) 1% phosphoric acid sol irrigations

(C) *Sodium citrate treatment*

Tech (α) Fluid intake 5 pints per day
\+ (β) Sodium citrate
40–60 grs every two hours
Upto 300–400 grs every day
↓ 30 grs four times a day
When urine is alkaline

Compl Hypochloræmia
Treat 1–2 z of common salt in diet

(3) **Urinary antiseptics:**

(a) *Hexamine*

(α) Forms formaldehyde in acid urine
(β) Definitely bactericidal in acid urine
(γ) Preparations (1) Cystopurin
(2) Cystoformin
(3) Cylotropin
(4) Amphotropin
(5) Helmitol

(b) Hexylresorcinol Caprokol

(α) Given in solution with olive oil
(β) Inferior to hexamine
(γ) Acts in both media

(c) Neotropin

(α) Brilliant orange coloured urine
(β) Not a good bactericidal

(d) Pyridium gr 1.5 tablet T D.S

(α) Deep orange coloured urine
(β) Good bactericidal

(e) Acriflavine 0.2 gm. capsules

(α) Bactericidal in alkaline urine only
(β) Bactericidal for B coli and staphylo

(f) Mercurochrome
  (α) Local irrigator
  (β) Intravenous

(g) *Methylene blue*
  (α) 1 4 grs in pill cachet or capsule
  (β) Second only to hexamine

(h) Camphoric acid
  (α) Acts in neutral or alkaline urine
  (β) Soothing in cystitis

(i) *Mandelic acid*

Ind Uncomplicated chronic urinary infection
  (a) Non operative group
    Chronic non obstructive infections
  (b) Pre operative group
    As a steriliser before operations
  (c) Post operative group

Contraind (a) Kidney inefficiency with uræmia
  (b) Acute febrile urinary infections

Dose (A) (a) Mandelic acid grs 45
    Soda bi carb grs 21
    Syrup auranti dr 1
    Aqua ounce 1
    Ounce one four times a day
  + (b) Ammonium chloride ounce 1
    Ext glycyrrhizæ liq drachms 4
    Aqua ad ounces 8
    One tablespoonful in water four times a day before food
  (B) (a) Ammon chlor mixture (See above)
  + (b) Sodium mandelate ounce 1.5
    Syrup auranti ounce 1 5
    Aqua ounces 8
    One tablespoonful in water four times a day after food
  (C) **Ammonium mandelate** ·
    Two drachms in water four times a day

Test 5 c c of urine + 5 min of buffered methyl red
  If (a) Bright yellow p H 5 3
    (b) Orange yellow too alkaline

(j) *Sulphanilamide group*

Ind (1) any reaction
  (2) Bactericidal to (α) Staphylococcus
    (β) B coli
    (γ) B pyocyaneus

(4) **Diet**
  (A) *Acidogenic*
    Bread + butter + cheese
    . Cereals + sugar + cream

(B) *Alkalogenic :*
: (α) Mixed fruit: dates, apples, bananas, orange, grape fruit
(β) Milk
(γ) Potatoes and onions
(δ) Vegetable soup and green salad

(5) **Urinary lavage:**
(α) Anti chemical solutions: soda bi carb
: phosphoric acid
(β) Antiseptic solutions: pot. permanganate
(γ) Styptic solutions: silver nitrate

(6) **Vaccines and sera**

(7) Treatment of etiology: constipation

(IV) HÆMATURIA:

Etio: (A) **Urinary:**

(1) Congestion			(1)	Kidney
(2) Inflammation			(2)	Pelvis
(3) Ulceration		of	(3)	Ureter
(4) New growth			(4)	Bladder
(5) Calculus			(5)	Prostate
(6) Trauma			(6)	Urethra

(B) **Blood diseases:**
: Purpura, hæmophilia

(C) **Reflex:**
: Appendicitis, salpingitis

Causes. (A) **Painless hæmaturia:**
(a) *At the beginning of micturition :*
Urethra growth
(b) *At the end of micturition :*
. Bladder (α) Growth: papilloma
(β) Stone?
(γ) Prostatic congestion
(c) *All throughout the micturition :*
(1) Ureter (α) Growth
(β) Ureterocele
(2) Kidney (α) Growth
(β) Stone
(γ) Tuberculosis
(δ) Polycystic disease
(3) Prerenal: (α) Purpura
(β) Arteriosclerosis

(B) **Painful hæmaturia:**
(a) *At the beginning of micturition :*
: Urethra. (α) Acute urethritis
(β) Caruncle
(γ) Stone
(δ) Clot — trauma

- (b) *At the end of micturition*
  - Bladder (α) Acute cystitis
    - (β) Calculus
    - (γ) Malignancy
    - (δ) Retention of clots
- (c) *All throughout the micturition*
  - (1) Ureter (α) Stone
    - (β) Blood clot
  - (2) Kidney (α) Pyelitis pyelonephritis
    - (β) Stone
    - (γ) Tuberculosis

(1) **Pronounced hæmaturia**

- (A) **Kidney** (a) **Purpura**
  - (b) Infarction
  - (c) **Trauma**
  - (d) **Papilloma** or carcinoma
  - (e) Hypernephroma
- (B) **Bladder** (a) Purpura
  - (b) Acute hæmorrhagic cystitis
  - (c) **Papilloma**
  - (d) Trauma
- (C) **Prostate** (a) **Carcinoma**
  - (b) Enlarged prostate
- (D) **Urethra** (a) **Growth**
  - (b) Trauma
- (E) Reflex appendicitis

(2) **Slight painful hæmaturia**
Urinary stone

Site (1) *Kidney*

- (a) **Renal colic**
- (b) Worm like clots
- (c) Albumin hæmoglobin $>$ 1.6 : 1
- (d) **Renal casts and epithelium**
- (e) Altered blood

(2) *Ureter*

- (a) Ureteral colic
- (b) **Worm like clots**

(3) *Bladder and posterior urethra*

- (a) **Only with micturition**
- (b) **Terminal hæmaturia**
- (c) Pain at the penile tip + strangury
- (d) **Coffee ground** or bright red
- (e) Bladder epithelium

(4) *Anterior urethra*

- (a) **Independent of micturition**
- (b) **Initial hæmaturia**

(c) **Bright red**
(d) Pencil clots

Compl : (1) Renal, ureteral or urethral colic
(2) Urinary infection
(3) Urinary calculi
(4) Anæmia

Treat : (A) **Medical :**
(a) Morphia :
. Contraindicated in kidney inefficiency
(b) Calcium lactate :
: 15 grs every four hours
(c) Coagulants
(d) Blood transfusion

(B) **Local :**
(a) Cold applications : ice packs
(b) Hot irrigations :
: Of bladder, renal pelvis
(c) Instillations .
(α) Adrenaline . 1 in 1,000
(β) Silver nitrate : 1 in 10,000

(C) **Surgical :**
(a) Nephrectomy :
Ind : Uncontrolled profuse renal hæmorrhage
(b) Suprapubic cystostomy .
Ind . (α) Bladder condition
(β) Clot retention

(V) PYURIA :

Etio : (A) **Pronounced :**
(1) *Kidney :* (a) **Pyonephrosis**
(b) Calculus
(c) Tuberculosis
(2) *Bladder :* (a) Acute cystitis
(b) **Diverticulum**
(c) **Burst appendicular abscess**
(3) *Prostate :* Burst prostatic abscess
(4) *Urethra :* (a) Acute urethritis
(b) Peri urethral abscess

(B) **Slight or microscopical :**
(a) All kinds of inflammation of all urinary organs
(b) Reflex congestion from neighbouring inflamm.

Treat : (A) Treatment of etiology
(B) Excision of the source :
(a) Nephrectomy
(b) Diverticulectomy
(C) Drainage :
(a) Nephrostomy
(b) Cystostomy

(VI) CRYSTALURIA LITHIASIS

(A) **Primary stones.** *Metabolic stones*

Path Arise from slow precipitation of crystalloids in colloid magma in acid urine

Etio (1) **Geography:**
- (a) England Derbyshire
- (b) Egypt and Palestine
- (c) **India.** (Rajputana, Cutch, Sind & Kathiawar)
- (d) China

(2) **Heredity:**
In cystin stones

(3) **Diet:**
- (a) Avitaminosis of Vitamins A, B and D
- (b) Faulty diet
- (c) Lack of water

(4) **Errors of metabolism:**

(A) *Calcium metabolism*

Etio (a) Hyper parathyroidism
(b) Prolonged immobilisation

Path (1) Skeletal decalcification
↓ (2) Raised blood calcium
↓ (3) Raised calcium excretion

Treat (a) Hyper parathyroidism
Removal of parathyroid adenoma
(b) Immobilisation
- (α) Plenty of fluids
- (β) Vitamins A, B and D
- (γ) Changes of posture
- (δ) **Keep the urine acid**

(B) *Oxalate diathesis*

Etio (a) Hyperchlorhydria
(b) Faulty diet
Rhubarb spinach, asparagus
(c) Faulty carbohydrate metabolism

Treat (1) Diet
(a) Avoid
Milk, eggs, tea, coffee, cocoa, sugar, rhubarb, paraffin
(b) Take
Meat, fish, bread, rice, butter
(2) Vitamins A, B, D
(3) **Keep the urine acid**
(4) Mag sulph or carb 30 grs daily

(C) *Uric acid diathesis*

Etio (a) Defective nucleo protein metabolism
(b) Excessive purine diet meat

Treat · (1) Diet ·
Avoid meat, sugars, starch
(2) **Keep the urine alkaline**
(3) Small doses of mercury.
Calomel 1/10 gr.

(D) *Cystinuria*

Etio Familial inborn metabolic error
Age Children
Path Deficient oxidisation of sulphur
Morb anat Flat, colourless, hexagonal crystals
Treat Keep the urine alkaline

(E) *Phosphaturia*.

Etio (a) Dyspepsia
(b) Phosphatic diabetes
(c) Alkaline urine
(α) Urinary infection
↓ (β) Decomposition of urea
↓ (γ) Liberation of ammon carb
↓ (δ) Conversion of normal phosphates into triple phosphates

Treat (a) **Keep the urine acid**
(b) Treat the urinary infection

(B) **Secondary stones:** *Local stones*

Path From local inflammation and decomposition of urine

Etio · (a) **Urinary infection:** Urea splitting organisms
(α) Staphylococcus
(β) B pyocyaneus
(γ) B proteus
(b) **Urinary stasis:**
Obstruction to urinary passages
(c) **Alkaline urine:**
. Conversion of healthy phosphates into triple phosphates by ammonium carb liberated from urea by organisms (See above)
(d) **Urinary passage inflammation:**
Provides calcium
(e) **Foreign bodies:** External or pathological
Provide nucleus

Treat (1) Treat the etiology
(2) **Descending drainage**
Plenty of fluids and diuretics

Investigations in urinary lithiasis:

(1) Family history
(2) Personal history.

(a) Residence
(b) Diet
(c) Fluid intake
(d) Urinary disease crystaluria
(e) Metabolic disease

(3) Examination
(a) Metabolic disease
Parathyroids
(b) Urinary obstruction or infection or crystaluria
(c) Blood
(α) Calcium content
(β) Phosphorus content
(γ) Urea and uric acid
(δ) Creatinine
(ε) Sugar
(d) *Jean s test for avitaminosis A*
(e) Chem cal examination of stone passed

General treatment of lithiasis

(1) **Treat the etiology**
(a) Metabolic
(b) Urinary (α) Obstruction
(β) Irritation
(γ) Infection

(2) **Descending urinary drainage**
Plenty of fluids + diuretics

(3) **Opposite chemical reaction**
Method (a) *Acidification*
Ind (α) Oxalates
(β) Carbonates
(γ) Phosphates
(b) *Alkalinisation*
Ind (α) Urates
(β) Cystine
Tech (a) Oral medication
(α) *Acid ammon phosphate acidity*
(β) Pot or sod citras alkalinity
(b) Local irrigations
1% phosphoric acid acidity

(4) **Vitamins** A B and D

(5) **Diet** (A) Avoid generally
Condiments dried fruit and vegetables spinach raisins almonds figs olives, parsnips cherries beets carrots cucumber celery rhubarb melon pine apple
(a) Oxalates Tea coffee sugar, paraffin
(b) Uric acid meat sugar, starch
(B) Take generally
Bread, butter, rice fish

(VII) PNEUMATURIA ·

Etio: (1) Instrumentation
(2) Vesico intestinal fistula:
(a) Congenital
(b) Appendicular abscess
(c) Tuberculosis
(d) **Regional ileitis**
(e) **Diverticulitis**
(f) **Carcinoma**
(3) Bacilluria
(a) Coli bacilli
(b) Gas producing bacteria

(C) ABNORMAL MICTURITION

(I) FREQUENCY OF MICTURITION

(A) *Physiological* More fluid intake, diuretics

(B) *Pathological*.

(1) *Polyuria:*
(a) **Functional:** Nervous
(b) **Extra-urinary general diseases:**
(α) **Diabetes**
(β) Tabes dorsalis
(c) **Kidney inefficiency:**
(α) Bacterial Pyelitis
· Pyelonephritis
. Pyonephrosis
(β) Non bacterial. **Chronic nephritis**
: **Hydronephrosis**
: Mobile kidney
. Polycystic kidney
: Growth

(2) *Local causes:*
(A) **Spasmodic bladder:**
(α) Congenital
(β) Secondary to chronic cystitis
(B) **Bladder irritation:**
(α) **Direct:**
(1) **Vesical calculus**
(2) Ureterocele
(3) **Altered urine:** High acidity
. Phosphaturia
. Oxaluria
(β) **Reflex:**
(1) Kidney: Calculus

(2) Ureter: calculus
(3) Rectum: **Proctitis**
: Worms

(C) **Bladder inflammation:**
(α) **Non-bacterial:**
(1) **Secondary congestion:** Append.
(2) Secondary trigonitis: cervicitis
(β) **Bacterial:**
(1) Primary: B coli; staphylo
(2) Secondary:
(*a*) Kidney: Pyelitis
: Pyelonephritis
: Pyonephrosis
(*b*) Bladder: Growth
: Stone
: Internal fistula
(*c*) Prostate: Prostatitis
: Prostatic abscess
: Prostatic calculi
(*d*) Urethra: Urethritis
(γ) **Urinary obstruction**

(D) **Involvement of nerve supply:**
(*a*) Malignancy of bladder and prostate
(*b*) Infiltrating neighbouring growths

(E) **Pressure from without:**
(*a*) **Pregnancy**
(*b*) Fibroids
(*c*) Ovarian cysts

(F) **Urinary obstruction:**
(*a*) Internal meatus spasm
fibrosis
(*b*) **Prostate:** (α) **Enlargement**
(β) Fibrosis
(γ) Carcinoma
(*c*) **Urethra:** (α) **Stricture**
(β) Calculus
(*d*) **Phimosis and pinhole meatus**
(*e*) **Cystocele and uterine displacements**

Treatment of frequent micturition: Treat the etiology

(II) INCONTINENCE OF URINE:

Def: Loss of voluntary control over micturition

Anat: Nerve mechanism of micturition:
(A) Afferents from bladder and post. urethra
(B) Urinary centre: in lumbar segment
(C) Efferents
(1) **Sympathetic: Anti-micturition**

Course: (*a*) 1, 2, 3 *lumbar* roots
↓ (*b*) Inferior mesenteric plexus
↓ (*c*) *Presacral nerve*
↓ (*d*) Hypogastric plexus
↓ (*e*) Bladder

Function. (*a*) Inhibition of detrusor
(*b*) Stimulation of sphincter

(2) **Parasympathetic: Micturition**

Course (*a*) 2, 3, 4 *sacral* roots
↓ (*b*) *Nervi erigentes* (Pelvic nerves)
↓ (*c*) Hypogastric plexus
↓ (*d*) Bladder

Function (*a*) Contraction of detrusor
(*b*) Relaxation of sphincter

Varieties: (A) *False incontinence*

Def: **Distended bladder** with overflow

Etio (1) **Urinary obstruction:**
(*a*) Stricture urethra
(*b*) Enlarged prostate

(2) **Nerve injury:**
(*a*) Early stages of supralumbar spinal
(*b*) Lesions of
(α) Lumbar centre
(β) Cauda equina
(γ) Hæmorrhoidal sympathetic plexus

(3) **Nerve disease:**
. Tabes dorsalis

(B) *True incontinence*

Def **Empty bladder** with involuntary micturition

Varieties: (1) *Passive true incontinence.*

Path Paralysis of internal sphincter
Clinic **Continuous dribbling**
Etio: (*a*) Difficult labour
(*b*) Cystocele
(*c*) Rupture urethra
(*d*) Perineal prostatectomy
(*e*) Nerve diseases

(2) *Active true incontinence.*

Path: Hyperspasm of detrusor
Clinic: (*a*) **Urgency of micturition**
\+ (*b*) Partial loss of control
Etio: (*a*) Acute trigonitis or cystitis
(*b*) Nerve diseases
(*c*) Later stages of supralumbar trauma:
: **Automatic bladder**

(*d*) Childhood
- (α) Physiological
  - Upto the end of second year
- (β) Reflex
  - (1) Abnormal urine acidity
  - (2) Regional proctitis worms
  - (3) Distant enlarged adenoids
- (γ) Essential enuresis

(C) *Automatic bladder*
- (1) Spinal cord injury
- ↓ (2) False incontinence with overflow
- ↓ (3) Automatic bladder

Etio (1) **Mechanical** (*a*) Trauma to the int. sphincter
- (α) Parturition
- (β) Cystocele
- (γ) Perineal operation
- (δ) Perineal trauma

↓ (*b*) Passive true incontinence

(2) **Obstructive** (*a*) Lower urinary obstruction
- (α) Urethral stricture
- (β) Enlarged prostate

↓ (*b*) False incontinence

(3) **Irritative** (*a*) Multiple sclerosis
- *or* (*b*) Local irritation
- ↓ (*c*) Active true incontinence

(4) **Nerve lesions**

(A) *Trauma*
- (*a*) Supralumbar
  - (α) False incontinence
  - ↓ (β) Automatic bladder
- (*b*) Lumbar or caudal
  - (α) False incontinence
  - (β) Partial voluntary control

(B) *Disease*
- (*a*) Tabes dorsalis
  - False incontinence
- (*b*) Multiple sclerosis
  - Active true incontinence

(5) **Juvenile enuresis**

Def Incontinence of urine in children above two years

Etio Hereditary familial congenital or acquired

Causes (*a*) **Lack of proper habit**
- (*b*) **Neurosis**
  - (α) Hypersensitiveness of lumbar centre
  - (β) Deficient cerebral inhibitory control

(γ) Spinal lesions
(1) Spina bifida occulta
(2) Tuberculosis

(c) **Adenoids and tonsils** ·
Asphyxial nervous irritability

(d) **Irritability of bladder:**
(1) Local
(α) Hyper acid urine
(β) Bacilluria
(2) Regional
(α) Phimosis and balanitis
(β) Vulvitis
(γ) *Proctitis and oxyurides*

(e) **Constitutional defects:**
(α) Diabetes mellitus and insipidus
(β) Anæmia
(γ) *General debility*

(f) **Chronic interstitial nephritis**

Clinical types (a) Nocturnal
(b) Nocturnal + diurnal

Treat **Treat the etiology:**

(1) *Mechanical*
(a) Muscular tonics
Strychnine, ergot, cantharides
(b) Peri urethral paraffin injections
(c) Plastic operations on sphincter
(d) Reformation of sphincter (Med Ann 1936)
Transplantation of gracilis

(2) *Nerve trauma and diseases*
(a) Aseptic catheterisation continuous
(α) Urethral
(β) Suprapubic
(b) Bladder lavages if chronic cystitis
(c) Urinary antiseptics + diuretics

(3) *Irritable bladder*
(a) Hot hip baths or enemata
(b) Diuretics and diluents
(c) Sedatives and antispasmodics
(d) Chemical opponents
(α) *Acidifiers*
(β) Alkalinisers

(4) *Juvenile enuresis*
(a) Treat the etiology
(α) Phimosis
(β) Worms
(γ) Enlarged tonsils

(ξ) Cerebral or spinal condition
(η) Habit

(b) ℞
Pot citras grs xv
Pot acetas grs xv
Tr hyoscyamus m x
Inf buchu ounce ss
ʒii — ʒiv every four hours

or (c) ℞
Pot bromide grs x
Tr belladonnæ m x
Inf buchu ounce ss h s

(d) Sacral epidural injection
1 5–5 5 drachms of sterile saline

(e) General urinary hygiene
(α) Passing urine at bed time
(β) Restriction of fluids before bed time
(γ) Removal of urinary or rectal irritation

(f) Psychological treatment
Praise and encouragement

(g) Hormono therapy
Prolan A & B + thyroid extract

(III) RETENTION OF URINE

Def Inability to pass urine, due to
(a) Urethral obstruction
(b) Loss of expulsive force of detrusor

Etio (1) *Obstructive causes*

(A) *Bladder*
(a) Internal
(α) **Calculus** or foreign body
(β) Pedunculated growths
(γ) Blood clot
(δ) Diverticulum
(b) External
(α) **Gravid uterus**
(β) Uterine fibroids
(γ) **Retroverted uterus**

(B) *Bladder neck and posterior urethra*
(a) Congenital sphincter spasm
(b) Congenital urethral valve
(c) **Acute posterior urethritis**
(d) **Calculus**, foreign body, **blood clot**
(e) **Prostatic affections**:
(α) Inflammation
(β) Stone
(γ) Enlargement
(δ) Fibrosis
(ε) Tumours

(*f*) Involvement in malignancy:
(α) Cervix
(β) *Rectum*

(C) *Anterior urethra:*
(*a*) **Stricture**
(*b*) Peri-urethral abscess or fistula
(*c*) Rupture
(*d*) **Calculus**; foreign body; blood clot
(*e*) Growths
(*f*) **Phimosis with pinhole meatus**
(*g*) Priapism
(α) Secondary to spinal lesions
(β) Reflex
(γ) Thrombosis of corpora

(2) *Non obstructive causes:*
(A) **Functional:** Mental; habit
(B) **Congestive:** Prolonged distension
(C) **Reflex:**
(α) Post operative
(β) Neighbouring inflammations
(D) **Atonic:**
(α) Nerve injuries or diseases
(β) Senile
(E) **Nervous:**
Tabes, myelitis; spina bifida
(F) **Toxic:**
(α) Fevers
(β) Chemical
(γ) Infections

Most common causes of retention:

(1) *Traumatic:*
(A) **Rupture urethra**
(B) **Post-operative reflex**
(C) **Spinal injuries**

(2) *Pathological:*
(A) *Child:*
(*a*) **Atresia meatus + phimosis**
(*b*) **Vesical or urethral calculus**
(B) *Males*
(*a*) Young adult male:
: **Acute gonorrheal urethritis**
(*b*) Middle-aged male:
: **Stricture urethra**
(*c*) Senile male:
: **Enlarged prostate**
(C) *Females:*
(*a*) Young adult female:
: **Retroverted gravid uterus**

(b) Middle aged female
Cystocele
(c) Senile female
Carcinoma cervix

Clinic (A) **Acute:**
(a) Inability to micturate with urgent desire
\+ (b) Acute painful distension
(B) **Chronic.**
(a) Incontinence + frequency with no desire
(b) Partial painless distension
(c) Signs of urinary back pressure

Diff diag (A) **Anuria:**
(a) Empty bladder
(b) Easy passage of catheter
(c) No urine drawn out
(d) Signs of uræmia
(B) **Rupture bladder**
(a) Empty bladder
(b) Easy passage of catheter
(c) Blood stained urine little quantity
(d) History of trauma
(C) **Acute retention:**
(a) Inability to micturate with urgent desire
(b) Acute painful distension
(c) Difficult passage of catheter
(d) Much urine drawn out
(D) **Chronic retention·**
(a) Incontinence or frequency with no desire
(b) Painless distension
(c) Passage of catheter
(α) Easy in non obstructive cases
(β) Difficult in obstructive cases

Differential diagnosis of etiology
? (1) *Obstructive*
(a) Bladder
(b) Posterior urethra
(c) Anterior urethra
? (2) *Non obstructive*
(a) Functional
(b) Congestive
(c) Reflex
(d) Atonic
(e) Nervous
(f) Toxic

Treat· (A) *Acute retention*
(1) **Conservative:**
(a) Hot bags → enemata → baths

+ (b) Sedatives: morphia, hyoscine
+ (c) Antispasmodics: atropine

↓ (2) **Catheterisation:**
- (a) Catheterisation:
  - (α) Urethral anæsthesia
  - ↓ (β) Passage of catheter:
    - (1) Rubber
    - (2) Gum elastic
    - (3) Metal
    - (4) Filiform bougies
- ↓ (b) Gradual decompression.
  - · 4 ounces an hour
  - (α) Intermittent
  - *or* (β) Continuous

↓ (3) **Suprapubic drainage:**
- (a) Suprapubic aspiration
- (b) **Suprapubic catheterisation**
- (c) Suprapubic cystostomy: contraindicated

(B) *Chronic retention:*

(1) **Drainage:** Gradual decompression
- (a) **Urethral:** Catheterisation
  - Tech (1) Meatal preparation
  - ↓ (2) Urethral anæsthetisation:
    - · By cocain bi carbonate
  - ↓ (3) Passage of catheter:
    - (α) Gum elastic coude No 12
    - (β) Gum elastic bicoude No 12
  - ↓ (4) Withdrawal of 15 ounces of urine
  - ↓ (5) Tying in the catheter with spigot
  - ↓ (6) Withdrawal of urine.
    - . 10 ounces every 2 hours
- (b) **Suprapubic:** Catheterisation
  - Tech: (1) 1% novocain infiltration
    - · Midline symphysis to umbilicus
  - ↓ (2) Suprapubic incision
  - ↓ (3) Dissection of prevesical fat
  - ↓ (4) Introduction of No 28 Malecot
  - ↓ (5) Drainage of Retzius
  - ↓ (6) Anchor catheter to skin
  - ↓ (7) Intravenous glass dripper
  - *or* (8) Kidd's U tube

(2) **Treat the underlying etiology**

After-treat: *Treat the urinary sepsis and back pressure:*

(1) **Drainage:** Gradual decompression (See above)

(2) **Urinary antisepsis:**
- (a) Chemical opponents
- (b) Urinary antiseptics
- (c) Local irrigations

(3) **Treatment of urinary back pressure failure:**
- (a) Plenty of fluids
- (b) Diuretics

Treatment of etiological varieties of retention.

(A) *Acute urethral retention*

(1) Hot bag → enema → bath
+ (2) Sedatives morphia hyoscine bromides
+ (3) Suppository Belladonna ext gr ½
Opium liq ext gr ½
+ (4) Oral medication
(a) Minim dose of ferric chloride every 5 min
(b) Spiritus etheris nitrosi half tea spoon
+ Water half a glass
Every fifteen minutes
↓ (5) Catheterisation
(a) Sterilise the glans
↓ (b) Urethral wash
Pot permang 1 in 5000
↓ (c) Urethral instillation
Novocain 5%
For fifteen minutes
↓ (d) Catheterisation
↓ (e) *Pot. permang lavage of bladder*
+ (6) Belladonna—opium suppository

(B) *Enlarged prostate retention*

(1) Most rigid aseptic and delicate catheterisation
Gum elastic or metal
↓ (2) Gradual decompression (See above)
+(3) Urinary mixture every four hours

Hexamine	grs v
Liq strychnine	m v
Inf buchu	ounce i

(C) *Acute organic retention* acute on-chronic

(1) Morphia ½ gr + Hot hip bath
↓ (2) Urethral gum elastic catheterisation
Tech (a) Sterilise the catheter
Plunge for 2 min in boiling water
↓ *Dip in sterile antiseptic lotion*
↓ (b) Urethral preparation
(α) Moist cleansing of glans
(β) Irrigation of ant urethra
↓ (c) Urethral anæsthetisation
Solutions (α) Novocain 4 %
(β) Percain 1 in 1500
(γ) Decicain 2 %
Quantity Two drachms
Time Five minutes
↓ (d) Sterile catheterisation
(α) Enlarged prostate

(1) Large bicoude gum elastic
+ (2) Rectal guiding finger
(β) Urethral stricture
(1) Olivary catheter
(2) Philip s screwing catheter
(3) Gum elastic bougie faggot
↓ (e) Tying in the catheter
↓ (f) Gradual decompression
(α) Intravenous saline dripper
40 60 drops per minute
or (β) Withdrawal of urine
10 ounces every two hours
↓ (3) Suprapubic catheterisation (See above)
or (4) Suprapubic puncture
By smallest lumbar puncture needle
(D) *Retention with overflow*
(1) Controlled decompression Saline dripper
(a) Urethral
(b) Suprapubic
+ (2) Continuous intravenous sod sulphate
(E) *Calculus retention* very painful
(1) *Calculus in fossa navicularis*
Meatotomy → extraction
(2) *Calculus in penile urethra*
(a) Bivona s device Urine wash
(α) Local anæsthesia
↓ (β) Compress the penile tip
↓ (γ) Pass urine
↓ (δ) Let go
↓ (b) External urethrotomy → extraction
(3) *Calculus in posterior urethra*
(a) Spinal anæsthesia
↓ (b) Urethral catheterisation
↓ (c) Dislodge the stone into bladder
↓ (d) Suprapubic lithotomy
(F) *Acute clot retention*
(1) Catheterisation → lavage
(a) Relief of retention
↓ (b) Bladder irrigation
or (2) Suprapubic cystostomy → lavage
(G) *Paralytic or cord bladder*
(1) Suprapubic catheterisation
↓ (2) Gradual continuous decompression
(a) Intravenous dripper method
+ (b) Closed sterile bottle drain

(IV) MICTURITION IN NERVOUS AFFECTIONS

Clinic (1) Pain (a) Continuous
(b) Crises

(2) Difficult micturition
(3) Complete retention
(4) Incontinence
  (*a*) False retention with overflow
  (*b*) True active incontinence
    (α) Active detrusor spasm
    (β) Passive sphincter paresis
  (*c*) Automatic bladder reflex micturition
(5) Urgency or absence of desire
(6) Signs (*a*) Collapsed bladder
  or (*b*) Distended bladder

Etio (A) Brain abnormalities
(B) Spinal abnormalities cord bladder
(C) Sympathetic and parasympathetic unbalance

Path (A) Irritative or spastic bladder
(B) Paralytic bladder

Path anat (A) ""

(B) Atonic bladder
  (*a*) Thin paralysed detrusor
  (*b*) Big capacity

Compl (1) Cystitis
(2) Trabeculations
(3) Phosphatic incrustations and calculi
(4) Diverticuli
(5) Back pressure syndrome
(6) Urinary sepsis syndrome

Treat (1) **Urinary drainage**
  (*a*) Intermittent catheter
  or (*b*) Permanent indwelling catheter
  or (*c*) Suprapubic catheter
(2) Prevention and treatment of cystitis
  (*a*) Chemical opponents
  (*b*) Urinary antiseptics
  (*c*) Urinary diluents
  (*d*) Bladder lavage
(3) Treatment of atony or spasticity
  Muscle tonics or antispasmodics

IMPORTANT POINTS

(1) Chief causes of anuria
  (*a*) Post operative renal failure
  (*b*) Ascending urinary infection
  (*c*) Calculus impaction.

(2) Hæmaturia
(a) Mild but painful stone
(b) Profuse but painless growth
(3) Pyuria
(a) Pyonephrosis
(b) Infected vesicular diverticulum
(c) Ruptured abscess
(4) *Incontinence of urine*
(A) *False*
Path Retention with overflow
Clinic Bladder full
(B) *True*
Path (a) *Active* spastic detrusor
(b) *Passive* paralytic sphincter
Clinic (a) *Active* bladder partially full
(b) *Passive* bladder empty
(C) *Automatic bladder*
Path Reflex micturition
Clinic Automatic evacuation of bladder
(5) *Causes of acute retention*
(a) *Child* (α) *Phimosis*
(β) *Stone*
(b) *Young adult male* *gonorrhœal urethritis*
(c) *Middle aged male* *stricture*
(d) *Old aged male* *enlarged prostate*
(e) *Young female* *gravid uterus*
(f) *Middle aged female* *cystocele*
(g) *Old female* *carcinoma cervix*
(6) Incontinence of urine is common in
(a) Multiparous women with difficult labour
(α) Sphincteral trauma
(β) Cystocele
(b) Young children nocturnal enuresis
(c) Old males with enlarged prostate
(d) Spinal injuries.
(7) *Acute retention of urine*
(a) *Try conservative methods first*
↓(b) *Gradual decompression* *4 ounces per hour*
(8) *Complications of retention urine*
(a) *Ascending infection*
(b) *Back pressure syndrome*
(c) *Reflex anuria* on sudden decompression
(d) Hæmaturia
(e) *Calculus*
(9) Causes of frequency of micturition
(a) Polyuria (α) Diabetes
(β) Nephritis

(b) Irritation of bladder: (α) Local irritation
(β) Neighbouring irritation

(c) Incontinence
(d) Chronic retention
(e) Nervous

(10) *In every case of urinary instrumentation or operation:*
(a) *Assess the back pressure syndrome*
(b) *Assess the urinary infection*
(c) *Assess the etiology of obstruction*
(1) *Give diuretics and diluents*
(2) *Give urinary antiseptics*
(3) *Use urethral anæsthesia*

(11) *Treatment of retention of urine:*
(A) *Drainage of the bladder:*
Site (a) Urethral
(b) Suprapubic
Method (a) Intermittent
(b) Constant
Time: (a) Temporary
(b) Permanent

(B) *Treatment of back pressure syndrome:*
(a) Prophylactic
(b) Curative

(C) *Treatment of urinary sepsis.*
(a) Prophylactic
(b) Curative
(α) General antiseptics
(β) Local irrigations

(D) *Treatment of etiology:*
(a) Obstruction
(b) Irritation
(c) Nervous
(d) Toxic.

(12) *Never use mercury oxycyanide solution for bladder lavage in cases of pyelography* as mercury iodide formed by its contact with sodium iodide is extremely irritating to the bladder.

(13) Intravenous pyelography is easy, can be done when instrumental one is impossible or inadvisable, is always bilateral and assesses the renal function at the same time, giving an idea of anatomical and physiological states of both the kidneys simultaneously.

(14) I [illegible] the intravenous [illegible] ice of the dye [illegible] unction.

(15) *Essentials in the treatment of acute and chronic retention*

(a) *Urethral anæsthesia*
(b) *Gentle instrumentation*
(c) *Rigid asepsis*
(d) *Gradual decompression*

(16) *Sudden decompression of a distended bladder leads to*

(a) *Hæmaturia*
(b) *Anuria*

(17) *Normal frequency of micturition in the male is 5–6 times during the day*, none in the night if no diuretics or insomnia. *Normal average amount is 50 ounces during 24 hours*

(18) Inability to pass urine may be due to two causes

(a) Retention bladder full
(b) Suppression bladder empty

(19) *Catheterisation should never be performed without cleansing the glans penis, irrigating the urethra and passing with surgically clean hands a sterile instrument, smeared with sterile lubricant*

(20) Differentially diagnose between

(1) Anuria
(2) Retention
  (a) Obstructive
  (b) Atonic.

(21) There are two main types of hæmaturia

(1) Painless
(2) Painful

Of which painless hæmaturia is more important on account of its usual association with urinary growths

(22) Location of hæmaturia

(a) Initial hæmaturia urethra
(b) Terminal hæmaturia bladder
(c) Mixed hæmaturia bladder, ureter, kidney

(23) Differential diagnosis between cystitis and calculus

(a) Acute cystitis
  (α) Terminal dysuria
  \+ (β) Frequency diurnal and nocturnal
  \+ (γ) *Hæmaturia + Pyuria*
(b) Vesical calculus
  (α) Terminal dysuria
  (β) Frequency diurnal only
  (γ) *Painful hæmaturia*

(24) Four types of urinary pain

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(a) *Assess the back pressure syndrome*
(b) *Assess the urinary infection*
(c) *Assess the etiology of obstruction*
(1) *Give diuretics and diluents*
(2) *Give urinary antiseptics*
(3) *Use urethral anæsthesia*

(11) *Treatment of retention of urine*
(A) *Drainage of the bladder:*
Site (a) Urethral
(b) Suprapubic
Method. (a) Intermittent
(b) Constant
Time: (a) Temporary
(b) Permanent
(B) *Treatment of back pressure syndrome:*
(a) Prophylactic
(b) Curative
(C) *Treatment of urinary sepsis:*
(a) Prophylactic
(b) Curative
(α) General: antiseptics
(β) Local irrigations
(D) *Treatment of etiology:*
(a) Obstruction
(b) Irritation
(c) Nervous
(d) Toxic.

(12) *Never use mercury oxycyanide solution for bladder lavage in cases of pyelography* as mercury iodide formed by its contact with sodium iodide is extremely irritating to the bladder.

(13) In [illegible] ...e done when instru[illegible] is always bilateral [illegible] e same time, giving an idea of anatomical and physiological states of both the kidneys simultaneously

(14) Interval of more than seven minutes between the *intravenous* injection of indigo carmine and the appearance of the dye at the ureteric orifices, denotes impaired renal function.

(15) *Essentials in the treatment of acute and chronic retention*

(a) *Urethral anæsthesia*
(b) *Gentle instrumentation*
(c) *Rigid asepsis*
(d) *Gradual decompression*

(16) *Sudden decompression of a distended bladder leads to*

(a) *Hæmaturia*
(b) *Anuria*

(17) *Normal frequency of micturition in the male is 5–6 times during the day,* none in the night if no diuretics or insomnia. *Normal average amount is 50 ounces during 24 hours*

(18) Inability to pass urine may be due to two causes

(a) Retention bladder full
(b) Suppression bladder empty

(19) *Catheterisation should never be performed without cleansing the glans penis irrigating the urethra and passing with surgically clean hands a sterile instrument, smeared with sterile lubricant*

(20) Differentially diagnose between

(1) Anuria
(2) Retention
    (a) Obstructive
    (b) Atonic.

(21) There are two main types of hæmaturia

(1) Painless
(2) Painful

Of which painless hæmaturia is more important on account of its usual association with urinary growths

(22) Location of hæmaturia

(a) Initial hæmaturia urethra
(b) Terminal hæmaturia bladder
(c) Mixed hæmaturia bladder, ureter, kidney

(23) Differential diagnosis between cystitis and calculus

(a) Acute cystitis
    (α) Terminal dysuria
    + (β) Frequency diurnal and nocturnal
    + (γ) *Hæmaturia + Pyuria*
(b) Vesical calculus
    (α) Terminal dysuria
    (β) Frequency diurnal only
    (γ) *Painful hæmaturia*

(24) Four types of urinary pain

Origin	*Site*	*Time*
Vesical	Hypogastric	Independent of micturition
Trigonal	Penile tip	At the end of micturition
Ure: ral	Local	During micturition
Prostate	Perineum Sacrum	Independent of micturition

(25) Five main variations in the character of micturition:
- (A) Altered stream:
  - : Urethral or bladder neck obstruction
- (B) Altered force of projection.
  - : Meatal, urethral or bladder neck obstruction
- (C) Difficulty
  - (α) Requiring straining · urethral stricture
  - (β) Worse on straining · enlarged prostate
- (D) Intermittent flow
  - (α) Calculus
  - (β) Diverticulum
- (E) Forked stream

(26) *Opium* is indicated in surgical renal hæmaturia. It *should be avoided in renal inefficiency* lest it should cause suppression of urine

(27) Alkalising method of treatment is a safe and satisfactory method in acute febrile types of urinary infection.

(28) Three groups of urinary antiseptics
- (A) Substances *liberating formaldehyde:*
  - : Hexamine with acid ammon phosphate
- (B) Substances liberating hydroxyacids·
  - : Ketogenic diet, mandelic acid
- (C) Substances of sulphonamide group:
  - : Prontosil, soluseptasine

(29) Indications in urinary sepsis.
- (A) Mandelic acid indicated in.
  - (*a*) Chronic sepsis
  - (*b*) Pure B. coli infection
  - (*c*) Good renal function
- (B) Sulphonamide group indicated in:
  - (*a*) Mixed infections
  - (*b*) Hæmolytic strepto. + B. proteus.

(30) B coli is easily killed by
(a) Sulphonamides
or (b) Mandelic acid

(31) Dosage with all mandelic acid preparations must be equal to *3 gms of mandelic acid 4 times a day after meals*

(32) Sulphonamide group is extremely valuable in urinary infections. It is effective in both acid and alkaline urine.

(33) Think of the possibility of hyper parathyroidism in every case of urinary stone multiple or bilateral urinary stones are present in over 80% of cases of parathyroid tumour, there is elevation of blood calcium

(34) Acetylcholine is very useful in post oper retention of urine

(35) *Acid ammonium phosphate is a better acidifier of urine than acid sodium phosphate*

(36) *Best urine antiseptics*
(A) *Hexamine*
(B) *Methylene blue*
(C) *Ammonium mandelate*
(D) *Sulphonamide*

(37) Mandelic acid and its derivatives have no place in the treatment of acute pyelitis where alkali treatment is the best.

(38) Alkalies though relieving general symptoms, rarely if ever cure the urinary infection

(39) Most satisfactory results of mandelic acid therapy have been in cases of long standing urinary infections.

(40) Presence of any obstruction to the outflow of urine and consequent stagnation makes the sterilisation of urinary tract very difficult.

(41) Frequency of micturition in young adults with sterile acid urine containing pus
? Renal tuberculosis.

(42) Frequency of micturition more marked during the day
? Uncomplicated bladder stone.

(43) *Most common causes of frequent micturition*
(A) *Polyuria* diabetes nervous
(B) *Irritation and spasm of the bladder*
(C) *Incomplete evacuation of the bladder*

(44) Normal micturition depends upon
(a) Patent urethra
(b) Contraction of detrusor
(c) Relaxation of sphincter

(45) *Incontinence is normal upto the end of the first year, continence is fully established by day and night at the end of second year, incontinence beyond the end of the third year is definitely morbid*

(46) *Enlargement of prostate and stricture of urethra together account for about 90% of acute urinary retentions*

(47) *Three fundamental principles in the treatment of acute urinary retention*
- (a) *Avoid infection*
- (b) *Avoid urethral laceration*
- (c) *Avoid repeated catheterisation*

(48) No portion of the catheter which enters the patient's urethra need and should be touched by hand

(49) *Longer the retention of urine, slower should be the rate of emptying*

(50) If after a reasonable attempt with catheters, the bladder is not entered two courses are open
- (a) Suprapubic puncture
- (b) Suprapubic catheterisation

(51) Repeated suprapubic punctures for acute retention are dangerous as leakage is liable to occur in the cave of Retzius.

(52) *Controlled gradual decompression of the bladder is of utmost importance in cases of retention with overflow*

(53) *Uræmia*
- (A) *Acute*
  - (a) Somnolence → stupor
  - (b) Nausea
  - (c) Headache
  - (d) Progressive weakness
- (B) *Chronic*
  - (1) *Cerebral*
    - (a) Headache
    - (b) Restlessness, insomnia
    - (c) Delusions
    - (d) Stupor → coma
  - (2) *Respiratory*
    - Dyspnœa
  - (3) *Gastro Intestinal*
    - (a) Anorexia
    - (b) Nausea → vomiting
    - (c) Constipation × diarrhœa
    - (d) Flatulence

(54) Non opaque stones
5% of all urinary stones are non opaque to X Rays They can be displayed by
- (a) Instrumental pyelography
  - Filling defect
- (b) Excretion pyelography
  - *Persistent shadow at one point*
    - (α) Arrest of the medium
    - (β) Staining by the medium

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(56) The first step in a case of nocturnal enuresis is a complete examination of the urinary tract and a radiograph to exclude spina bifida.

(57) Congenital syphilis plays a very important role in the pathogenesis of enuresis both in childhood and later life

(58) Half an ounce of a 1–15 solution of liq potash acetat by mouth, repeated every half an hour for eight doses, is exceptionally effective in post operative retention of urine (Med Ann 1934)

(59) Acute post operative retention never occurs before puberty

(60) *Proctoclysis favours retention of urine, and removal of rectal tube many a time helps in overcoming the difficulty*

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- . Dyspnœa

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CHAPTER II

THE KIDNEYS

(I) CONGENITAL MALFORMATIONS·

(1) SOLITARY KIDNEY

Etio 1% of post mortem findings?
Clinic (a) No symptoms
(b) Cystoscopy one ureteric orifice
Compl Uræmia after inadvertent removal
Treat Make sure of the other functioning kidney before every nephrectomy

(2) ATROPHIC KIDNEY

Path One kidney functionless
Contralateral kidney larger
Clinic Cystoscopy both ureteric orifices present

(3) DOUBLE KIDNEY

(a) Double Kidneys
(b) Double pelves
(c) Double ureters

(4) ECTOPIC KIDNEY

Sites (a) Pelvic kidney
Lateral to rectum (personal case)
(b) Promontoric kidney
(c) Iliac kidney
Clinic Firm round swelling
In any of the above sites
Compl Inflammation
Diff diag Any abdominal tumour or abscess

(5) HORSE SHOE KIDNEY

Etio 1 in 700 bodies
Males females 8 3
Clinic (a) Epigastric or umbilical pain
(b) Chronic constipation
(c) Recurrent pyelitis
(d) Rovsing
Pain on extention of trunk
(e) Supra-umbilical swelling
In front of vertebræ
X Ray Pyelography Pelves abnormally low
One of the calyces turned inwards
Compl (a) Kinking of ureter
(α) Urinary stasis hydronephrosis
(β) Urinary infection pyelitis
(γ) Urinary calculus
(b) New growth
(c) Difficulty in diagnosis

Treat (1) Extraperitoneal division of isthmus
↓ (2) Nephropexy

(6) POLYCYSTIC KIDNEY

Etio (a) Age (α) Infants
(β) Adults About 40
(b) Sex females
(c) Incidence (α) Familial
(β) Hereditary

Cause Theories
(A) Congenital Developmental
Failure of union between
(α) Excretory canals (Wolffian)
& (β) Convoluted tubules (Metanephros)
(B) Inflammatory nephritis
(C) New formation

Path Multiple translucent cysts
Associated or not with similar condition of other solid viscera e g liver and pancreas

Clinic (A) Infant
(a) Enormous swelling
↓ Difficult labour
(b) Anuria → uræmia
(B) Child
(a) Bilateral multilocular swellings
+ (b) Urinary insufficiency
(C) Adult 35–45
(a) *Insidious*
Knobby kidney on routine exam
(b) *Uræmia*
Insidious renal insufficiency
(c) *Tumour*
Multilocular renal tumour
(d) *Infection*
Pyelitis with urinary sepsis
(e) *Hæmaturia*
Painless intermittent

Sign Pyelogram
(a) Kidney inefficiency
(b) Encroachment on pelvis
(c) Narrow and lengthened calyces
(d) Ureter deviated to mid line

Compl (1) Kidney failure
(2) Infection
(3) Ptosis and abnormal mobility
(4) Rupture of the cysts
(5) Hæmaturia
(6) Associated condition of other organs

Treat Rovsing s operation (Personal case)
Ind Pain hæmaturia, infection

Tech. (a) Exposure
↓ (b) Incision of the cysts
↓ (c) Drainage

(7) MOVABLE KIDNEY:

Etio: (a) Age 25–30
(b) Sex: Females
(c) Side: Right

Causes: (1) Congenital
(2) Peri renal atrophy
(3) Visceroptosis
(4) Kidney tumour
(5) Weak abdominal wall

Varieties: (A) **Palpable kidney:**
Lower half felt on deep inspiration
(B) **Mobile kidney:**
(a) Upper pole felt on deep inspiration
(b) Replacement preventable
(C) **Floating kidney:**
(a) Freely mobile
(b) Crosses the mid line

Path. Range of mobility:
. Arc of a circle whose radius is renal pedicle

Clinic. (A) *Local*·
(1) Pain and discomfort
(2) Undue mobility
(3) Lack of normal resistance in loin
(B) *Referred:* due to drag
(1) Pyloric obstruction
(2) Biliary obstruction
(3) Colic obstruction
(C) *Nervous*. neurasthenia
(D) *Associated:* visceroptosis

Clinic. types: (1) **Symptomless:** Latent
: Accidental find in routine exam.
(2) **Tumour:**
: Mobile, tender, palpable kidney
(3) **Painful:**
(a) Local tension + motion
(b) Crises:
(α) Acute pyloric obstruction
(β) Acute ureteric obstruction
(γ) Acute pedicle torsion
(4) **Complication:**
(a) Obstruction: (α) Hydronephrosis
(β) Uræmia

(b) Sepsis urinary sepsis
(c) Torsion hæmaturia

Sign: **Pyelogram: In different positions**
(a) Descending
(b) Ascending

Diagnosis (a) Exaggeration of symptoms by exertion
(b) Relief from symptoms by rest
(c) Palpable lump

Diff diag (A) **Any intra abdominal tumour:**
(1) Gastro duodenal
(2) Colic
(3) Gall bladder
(4) Ovarian
(5) Omentum or mesentery

(B) **Abdominal colics:**
(1) Intestinal
(2) Biliary
(3) Urinary

Compl. (1) **Obstruction:**
(a) Urinary (α) Hydronephrosis
(β) Renal insufficiency
(b) Vascular (α) Hæmaturia
(β) Suppression

(2) **Infection**

(3) **Crises:**
Clinic (a) History of exertion
(b) Lumbar pain + vomit + rising pulse
(c) Rigidity + tenderness + tumour
(d) Slight temperature

Diff diag **Acute abdomen:**
(a) Ureteric colic
(b) Acute appendicitis
(c) Acute cholecystitis
(d) Perforated peptic ulcer
(e) Twisted ovarian cyst

(4) **Neurasthenia**

Treat (A) **Expectant:**
(1) Symptomless type
Do not mention to the patient
(2) Complicated type.
Treat the complications

(B) **Palliative:**
(1) Kidney supports
(2) Abdominal exercises
(3) Rest + tonics + diet

(C) **Operative:**
Ind. (a) Failure of palliative measures
(b) Presence of complications

(c) Laborious occupation
(d) Relief by rest
(e) Neurasthenia not pronounced

Contra ind (a) Latency of symptoms
(b) Non relief by rest
(c) Pronounced neurasthenia
(d) Pronounced visceroptosis

Tech (1) Thomson Walker
(α) Decapsulation
\+ (β) Suture to quad lumb
(2) Sling method
(α) Decapsulation
\+ (β) Fascia lata sling
(3) Edebohls
Fibrous capsule flaps
(4) Gauze pack method
(5) Peritoneal shelf method

(8) ABERRANT RENAL VESSELS

Etio (a) Age (α) Early life
(β) Between 30 and 40
(b) Sex female
(c) Side right

Varieties (1) Two independent arteries
Early childhood syndrome
(2) Early division of renal artery
(3) Scissor grip
(4) Inferior branch obstruction

Clinic Hydronephrosis with urinary obstruction

Diff diag Ureteral kink obstruction

Compl Urinary obstruction with its complications

Treat (A) Vein cut
(B) Artery
(a) Small cut
(b) Large re implantation of ureter

(II) RENAL TRAUMA

(1) RENAL INJURIES

Etio (a) Run overs
(b) Stab wounds

Path (1) **Subcutaneous**
(a) Contusion
(b) Rupture
(2) **Penetrating**
Stab wounds

Clinic (1) History
(2) Shock + nausea with vomit

(3) **Hæmaturia :** (*a*) Primary
(*b*) Reactionary
(*c*) Secondary
(4) Peri renal hæmatoma (or wound)
Tenderness + rigidity + swelling
(5) Meteorism

Compl (*a*) Hæmaturia
Pronounced & persistent
May be absent complete avulsion
complete laceration
ureteral blockage
(*b*) Dysuria
(*c*) Anuria
(*d*) Urinary sepsis
(α) Extravasation of urine
(β) Peri nephric abscess
(*e*) Associated injuries
(α) Intestinal trauma
(β) Intraperitoneal hæmorrhage

Diagnosis (In mild &/or persistent hæmaturia) cystoscopy

Treat (A) **Conservo-observative :**
(1) Morphia + anti shock
(2) Local ice bag
(3) Blood coagulants
(4) Urinary antiseptics
(5) Observation
(*a*) *Half hourly pulse rate*
(*b*) *Every urine specimen*

(B) **Operative**
Ind (1) Associated intraperitoneal lesion
(2) Rising pulse rate
(3) Pronounced persistent hæmaturia
(4) Extravasation of urine
(5) Infection
(6) Secondary hæmorrhage

Tech (1) **Exploration :**
(*a*) Lumbar
(*b*) Abdominal
Ind Suspected intraperit lesion
Tech (α) Small peritoneal incision
(β) Treat abdominal lesion
↓ (γ) Do lumbar exposure

(2) **Treatment of trauma :**
(*a*) **Sutures :** Over muscle strip
or (*b*) Packing
or (*c*) Drainage
or (*d*) **Nephrectomy :**

Ind (1) *Torn renal pedicle*
(2) Severe renal laceration
(3) Unsuturable rent
(4) Extensive pelvic rupture
(5) Avulsion of ureter
(6) Uncontrollable hæmorrhage
(7) Diseased kidney

(2) PERI RENAL HÆMATOMA

(A) **Traumatic:**

Treat (1) Expectant rest + ice + coagulants
↓ (2) Exploration → drainage
(*a*) Anterior extraperitoneal route · Grid iron
(*b*) Posterior or lumbar route

(B) Spontaneous

Causes (*a*) Renal aneurysm
(*b*) Renal growths

Clinic (1) Abdominal pain
(2) Signs of internal hæmorrhage
(3) Lumbar swelling

Treat Nephrectomy

(III) RENAL OBSTRUCTION:

(1) ANURIA (See page 1585)

Def Total suppression of urine

Cause Acute and complete bilateral urinary obstruction

Etio (A) **Pre-renal** · Circulatory shock

(B) **Renal.** *Destruction or removal*

(C) **Post renal** ·
(*a*) Obstructive
(*α*) Bilateral cancer cervix
(β) Unilateral functioning stone
(γ) Reno renal reflex stone
(*b*) **Sudden complete relief of obstruction** Acute urinary retention

(D) **Toxic** ·
(*a*) Hæmatogenous
(*b*) Ascending urinary

Clinic (A) **Initial stage.**
(1) History
(*a*) *Urine not passed for some time*
(*b*) Catheter not yielding any urine
(2) *Collapsed bladder*
(3) *No urine on catheterisation*

(B) **Tolerance stage:** One week
: No general symptoms + anuria
(C) **Uræmic stage:**
(α) Early stage:
: Headache + dry tongue + meteorism
(β) Late stage:
: Uræmic convulsions and coma

Diagnosis: (1) **Of anuria:**
: From retention
(2) **Of the cause of anuria:**
(*a*) Toxic
(*b*) Infective
(*c*) Obstructive
(*d*) Reflex
(3) **Of the side affected:**
(*a*) Side of recent pain
(*b*) *Side of tender rigidity*
(*c*) X-Ray

Treat: (See page 1587)

(2) HYDRONEPHROSIS:

Def: **Dilatation of kidney pelvis and calyces** accompanied by absorption of renal parenchyma, due to chronic aseptic retention of urine in the kidney and the renal pelvis, **caused by chronic intermittent-but-complete or constant-but-incomplete obstruction** in the ureter or urethra

Etio: (1) **Unilateral hydronephrosis:**
(A) **Ureteral obstruction:**
(*a*) *Lumen:* (1) *Calculi*
(2) F.B.; blood clot
(3) Tumour
(*b*) *Wall:* valves, folds, *strictures*
(*c*) *External.*
(1) Tumours
(2) Bands and adhesions
(3) Perinephric abscesses
(4) *Aberrant vessels*
(B) **Renal pedicle obstruction:**
(*a*) *Kinking*
(1) Mobile kidney
(2) Genital kidney:
(α) Chronic genital infection
↓ (β) Upward lymph spread
↓ (γ) Atonic ureter and pelvis
↓ (δ) Pelvi ureteral kink
(*b*) *Torsion pedicle:*
: Mobile kidney

(C) **Idiopathic** ·
Neuro muscular inco ordination

(2) **Bilateral hydronephrosis** :

Causes **Urethral obstruction** :

(a) *Congenital*
(1) Pin point meatus
(2) *Valve or fold* (in posterior urethra)

(b) *Acquired*
(1) Stricture
(2) Enlarged prostate
(3) Pelvic tumour

Varieties (1) *Etiological*
(A) **Congenital** hydronephrosis
(B) **Obstructive** hydronephrosis
(C) **Idiopathic** hydronephrosis
Small painful hydronephrosis

(2) *Causative*
(A) **Calculus** : (Obstructive)
(B) **Traumatic**
(C) **Mobile** : (kink or torsion)

(3) *Clinical*
(A) Closed or constant
(B) Open or intermittent
(C) Unilateral, bilateral

(4) *Anatomical*
(A) **Pelvic**.
Etio Upper urinary tract obstruction
(B) **Renal** ·
Etio Lower urinary tract obstruction

Clinic (1) **Renal signs · Tumour with tension pain**
(A) Closed hydronephrosis **Constant**
(B) Open hydronephrosis
(a) Intermittent renal colic
↓ (b) { (α) Oliguria
(β) Painful renal swelling
↑ (c) { (α) Polyuria
(β) Disappearance of renal tumor
Pain + tumor ∝ inversely with urine
(C) Idiopathic hydronephrosis
Position-relief syndrome

(2) **General signs Urinary toxæmia**
Uræmia (in bilateral cases)

(3) **Special signs** :
(1) Blood urea
(2) Plain X Ray
(3) Excretion pyelography

(4) Cystoscopy:
(*a*) Simple
(*b*) Chromo cystoscopy
(*c*) Ureteral catheterisation:
: Estimation of pelvic capacity
(*d*) Ascending pyelography

Compl: (1) Anuria → uræmia
(2) **Sepsis**: Pyelonephritis → pyonephrosis
(3) Calculi
(4) Rupture

Treat: (A) *Removal of the cause:*
(1) Dilatation of stricture urethra
(2) Removal of prostatic obstruction
(3) Treatment of ureteral conditions:
(*a*) Pinhole orifice
(*b*) Impacted stone
(*c*) Kink, valve or fold
(4) Fixation of mobile kidney

(B) *Local treatment:*
(1) **Conservative:**
Ind. Mild unilateral or bilateral
Tech (*a*) Removal of cause
(*b*) Periodical observations:
(α) Pyelograms
(β) Renal function tests
(γ) Clinical symptoms
(2) **Nephrectomy:**
Ind: (*a*) Large and thin-walled sac
(*b*) Sepsis
(*c*) Stone
+ (*d*) Other kidney . healthy
(3) **Plastic + temporary nephrostomy:**
Ind (*a*) No infection
(*b*) No distal obstruction
(*c*) Functioning kidney
Tech (*a*) Pyeloplasty
(*b*) Pyeloplication . Israel
(*c*) Triangular resection:
. Thomson Walker
(*d*) Orthopædic resection:
. Albarran
(*e*) Excision of the sac:
: Von Lichtenberg
(4) **Palliative:**
Tech. (*a*) Renal decapsulation
(*b*) Ureteric transplantation
(5) **Renal sympathectomy:**
Ind: Idiopathic hydronephrosis

(IV) RENAL SEPSIS:

Etio Age **Children**
Sex ***Pregnant women***
Predisp: (*a*) **Lower genito urinary sepsis**
(*b*) Constipation
(*c*) Acute illness
Site Right kidney

Path (1) *Routes of infection*
(A) **Descending:** Hæmatogenous
Septicæmic, pyæmic
(B) ***Ascending:***
Ascending lower urinary sepsis
(C) **Obstruction with stasis:**
Urinary passage obstruction
(D) **Irritation:**
Stone excretion of irritants
(E) **Migration:**
(*a*) B coli from intestines
(*b*) Septic cervix

(2) *Pathological groups*
(A) ***Cavity:***
(*a*) Pyelitis
(*b*) Pyelonephritis
(*c*) Pyonephrosis
(B) **Substance:**
(*a*) Renal abscess
(*b*) Renal carbuncle
(C) ***Exterior:***
(*a*) Perinephritis
(*b*) Perinephric abscess
(α) Primary local cause
(β) Secondary to
(1) Kidney sepsis
(2) Neighbouring sepsis
(3) Pyæmia

Bacterio (1) B coli
(2) Pyococci staphylo, strepto

Clinic. varieties.
(1) **Fulminating:** General + + +, local +
(2) **Acute** : General + +, local + +
(3) **Subacute** : General +, local +
(4) **Chronic** : General —, local +
(5) **Recurrent** : General and local exacerbations

Clinic: (1) *General*
(*a*) Septic **toxæmia**
(*b*) Uræmia
(2) *Local*
Pain + tenderness + rigidity + swelling

(3) *Urinary:*
- (a) Bacill-hæmat-**py-uria**
- (b) Olig an-uria
- (c) **Micturition:**
  - : Frequency, dysuria, strangury

(4) *Etiological:*
- **: Signs and symptoms of causative factor:**
  - (a) Urinary
  - (b) Genital
  - (c) Intestinal
  - (d) Hæmatogenous: furunculosis etc.

Signs: (1) Cystoscopy
- (2) Ureteral catheterisation
- (3) Pyelography. (a) Descending
  - (b) Ascending
- (4) Microscopical and cultural exam. of urine

Diff diag. (1) **General sepsis and pyrexias:**
- (a) Malaria
- (b) Typhoid
- (c) Septicæmia
- (d) Pyæmia

(2) **Causes of uræmia:**
- (a) Reflex
- (b) Obstructive

(3) **Renal diseases:**
- (a) Simple urinary obstruction
- (b) Renal growths
- (c) Mobile kidney

(4) **Regional inflammations:**
- (a) Acute appendicitis
- (b) Acute ureteral colic
- (c) Acute cholecystitis
- (d) Acute basal empyema

Diff. diag.: *Of the etiology of renal sepsis:*
- (1) Hæmatogenous. furunculosis
- (2) Obstructive · enlarged prostate
- (3) Irritative. renal calculus
- (4) Migrating: constipation
- (5) Ascending · urethritis

Compl: (1) Exacerbations
- (2) Persistent cystitis
- (3) Secondary calculus
- (4) Anuria → uræmia
- (5) Septicæmia

Treat · (I) *Conservative:*
- (A) **Urinary sepsis:**
  - (a) Diuretics and diluents

(b) Urinary antiseptics
  (α) Hexamine
  (β) Cystamin
  (γ) Helmitol
  (δ) Cystopurin

(c) Chemical treatment
  (α) Acid urine

  ℞ Pot citras gr 60
  Syr aurantii qs
  Aqua add ounce ½
  To be taken every 4 hours

  (β) Alkaline urine

  ℞ Acid ammon phosph gr xx
  Syr limonis drachm ½
  Aqua add ounce 1
  T D S

(d) Intravenous dyes
  (α) Mercurochrome
  (β) Gentian violet

(e) Mandelic acid treatment

(f) Vaccines

(B) **Anuria → uræmia**
  Intravenous (a) Glucose
  (b) **Sod sulphate**
  (42 85 grams per litre)
  (c) Saline

(C) **General sepsis** Chemotherapy
  Sulphonamide group
  (a) Sulphanilamide
  (b) M & B 693
  (c) Prontosil
  (d) Soluseptasine

(D) **Local treatment**
  (a) Hot hip baths or fomentations
  (b) Cupping

(II) *Operative*
  (1) **Urethral drainage**
  Self retaining catheter
  (2) **Ureteral drainage** Ureteral catheter
  (3) **Suprapubic cystostomy**
  (4) Nephrostomy
  (5) Nephrectomy

Individual conditions in renal sepsis

(A) PYELITIS

Def Inflammation of renal pelvis

Etio (a) Children
  (b) Pregnant women

Clinic (a) Painful tender loins
(b) Symptoms of cystitis
(c) Urine examination
(d) Septic toxæmia temp +

Signs (1) Cystoscopy
Ureteral opening changes
(2) Ureteral catheterisation
Urine from affected pelvis
(3) Intravenous urography
Faint shadow
(4) Ascending urography

Treat (1) *Removal of etiology*
Lower urinary focus
Renal focus
(2) *Pyelitis itself*
(A) *Acute pyelitis*
(a) *Severe onset*
(1) **Pituitrin** ½ — 1 c.c
For pain
(2) **Fluids**
Glass of fluid
Every half hour to one hour
(3) **Alkalies**
Pot citras mixture
Every two hours
(4) **Sulphonamide**
Gms 3 daily

↓ (b) *Non amelioration after 36 hours*
(1) Treatment under (a)
+ (2) **Intravenous urotropin**
5 c cs of 40% sol daily
+ (3) **Indwelling ureteric catheter**
Pelvic lavage every 4 hours
↓ (4) **Nephrostomy**
Ind Ultra acute oliguric cases
+ (5) **Intravenous sod sulphate**

(c) *Pregnancy pyelitis*
(1) **Postural treatment**
Knee chest position
(2) **Hydrotherapy**
(3) **Alkaline treatment**
↓ (4) Ureteral catheterisation
+ (5) Pelvic lavage
↓ (6) Termination of pregnancy
Ind Bilateral pyelitis + uræmia

(B) *Chronic pyelitis*
Def 10 days after temp is normal
Treat (*a*) Acid treatment with hexamine
(*b*) Mandelic acid treatment
(*c*) Urinary lavages
(*a*) Bladder
Acriflavine 1–8000
Every day
(β) Renal pelvis
Acriflavine 1–2000
Weekly

(B) PYELONEPHRITIS

Def Inflammation of renal pelvis and tissue

Path types (1) **Aseptic pyelonephritis**
Excretion of irritants
(2) **Septic pyelonephritis**
(A) **Descending or hæmatogenous**
(*a*) Fulminating
(*b*) Acute
(*c*) Chronic
(B) **Ascending pyelonephritis**
(*a*) Fulminating
(*b*) Acute
(*c*) Chronic
(C) **Pregnancy or puerperal pyelonephritis**
Etio (α) Unilateral
(β) Right kidney
(γ) Fifth month
Predisp (1) Urinary stagnation
Due to (*a*) Vesical hypertrophy
(*b*) Uterine pressure
(2) Urinary infection
B coli bacilluria
(3) Constipation
(4) Genital lesion

Clinic (1) Presence of
(*a*) Acute septicæmia
or (*b*) **Lower urinary sepsis**
or (*c*) Pregnancy or puerperium
(2) **Sudden and high rise in temperature**
(3) Acute urinary crisis

Compl (1) Toxæmia
(2) Uræmia
(3) Pyonephrosis

Treat (1) **Acute hæmatogenous pyelonephritis.**
(A) **Mild**
(*a*) Hydrotherapy

(b) Alkalies:
: Pot. citras grs. xxx
Soda bi carb grs. xxv
: Every 6 hours
(c) Aperients
(d) 10 c cs. of 1% mercurochrome
: Intravenous
(e) Chemotherapy: sulphanilamide

(B) **Severe:**
(a) As in (A)
\+ (b) Antiserum 25 c.cs.
↓ (c) Bladder lavage } acriflavine
↓ (d) Renal lavage } 1 : 5000
↓ (e) Nephrectomy:
Ind: (α) Fever for over 4 weeks
(β) Unilateral sepsis
(f) Nephrostomy:
Ind: Suppression of urine

(2) **Acute ascending pyelonephritis:**
(a) As in (1)
\+ (b) Early suprapubic cystostomy:
Ind: Lower urinary obstruction
or (c) Nephrostomy:
Ind: Suppression of urine

(3) **Chronic suppurative pyelonephritis:**
(a) Catheter drainage + bladder lavage
\+ (b) Fluids + diuretics + antiseptics
↓ (c) Eradication of etiology:
(α) Lower urinary sepsis
(β) Lower genital sepsis
(γ) Migration sepsis

(4) **Pregnancy or puerperal pyelonephritis:**
(A) *Prophylactic*
(a) Treatment of genital lesion
(b) Fluids + diuretics + alkalies
(c) Laxatives
(B) *Curative:*
(1) *Unilateral:*
(a) Treatment as under (A)
↓ (b) Hexamine + acid mixture
↓ (c) Mandelic acid treatment
↓ (d) Ureteral catheterisation drain:
: With pelvis lavage
↓ (e) Nephrostomy:
: With pelvis lavage
↓ (f) Nephrectomy

(B) *Chronic pyelitis:*
Def.: 10 days after temp. is normal
Treat: (*a*) Acid treatment with hexamine
(*b*) Mandelic acid treatment
(*c*) Urinary lavages:
(α) Bladder:
: Acriflavine 1–8000
: Every day
(β) Renal pelvis:
: Acriflavine 1–2000
: Weekly

(B) PYELONEPHRITIS:
Def: Inflammation of renal pelvis and tissue
Path. types: (1) **Aseptic pyelonephritis:**
. Excretion of irritants
(2) **Septic pyelonephritis:**
(A) **Descending or hæmatogenous:**
(*a*) Fulminating
(*b*) Acute
(*c*) Chronic
(B) **Ascending pyelonephritis:**
(*a*) Fulminating
(*b*) Acute
(*c*) Chronic
(C) **Pregnancy or puerperal pyelonephritis:**
Etio: (α) Unilateral
(β) Right kidney
(γ) Fifth month
Predisp: (1) Urinary stagnation:
Due to: (*a*) Vesical hypertrophy
(*b*) Uterine pressure
(2) Urinary infection:
: B. coli bacilluria
(3) Constipation
(4) Genital lesion
Clinic: (1) Presence of:
(*a*) Acute septicæmia
or (*b*) **Lower urinary sepsis**
or (*c*) Pregnancy or puerperium
(2) **Sudden and high rise in temperature**
(3) Acute urinary crisis
Compl: (1) Toxæmia
(2) Uræmia
(3) Pyonephrosis
Treat: (1) **Acute hæmatogenous pyelonephritis:**
(A) **Mild:**
(*a*) Hydrotherapy

(b) Alkalies:
: Pot. citras grs. xxx
Soda bi-carb grs. xxv
: Every 6 hours
(c) Aperients
(d) 10 c.cs. of 1% mercurochrome
: Intravenous
(e) Chemotherapy: sulphanilamide

(B) **Severe:**
(a) As in (A)
\+ (b) Antiserum 25 c.cs.
↓ (c) Bladder lavage } acriflavine
↓ (d) Renal lavage } 1 : 5000
↓ (e) Nephrectomy:
Ind: (α) Fever for over 4 weeks
(β) Unilateral sepsis
(f) Nephrostomy
Ind: Suppression of urine

(2) **Acute ascending pyelonephritis:**
(a) As in (1)
\+ (b) Early suprapubic cystostomy:
Ind: Lower urinary obstruction
or (c) Nephrostomy
Ind: Suppression of urine

(3) **Chronic suppurative pyelonephritis:**
(a) Catheter drainage + bladder lavage
\+ (b) Fluids + diuretics + antiseptics
↓ (c) Eradication of etiology:
(α) Lower urinary sepsis
(β) Lower genital sepsis
(γ) Migration sepsis

(4) **Pregnancy or puerperal pyelonephritis:**
(A) *Prophylactic.*
(a) Treatment of genital lesion
(b) Fluids + diuretics + alkalies
(c) Laxatives
(B) *Curative:*
(1) *Unilateral:*
(a) Treatment as under (A)
↓ (b) Hexamine + acid mixture
↓ (c) Mandelic acid treatment
↓ (d) Ureteral catheterisation drain:
: With pelvis lavage
↓ (e) Nephrostomy:
: With pelvis lavage
↓ (f) Nephrectomy

(2) *Bilateral*:
- (a) Medicinal + instrumental treat.
- + (b) Induction of premature labour

(C) PYONEPHROSIS.

Def. Dilatation and distension of kidney and its pelvis with pus or purulent urine

Path. types. (1) **Uro-pyonephrosis**: Infected hydronephrosis
- (a) Renal type
- (b) Pelvic type

(2) **Pyelonephritic pyonephrosis**

(3) **Calculous pyonephrosis**

Clinic. (1) Pain
- (a) Lumbar
- (b) Ureteral colic

(2) ***Lumbar swelling***:
- (a) Tender
- (b) Varying sized
- (c) Reniform

(3) **Pyuria**: Quantity of pus depends on
- (a) Open variety
- (b) Closed variety

(4) Septic toxæmia

(5) Primary etiology:
- (a) Hæmatogenous
- (b) Ascending urogenital

Diag Pyuria varying conversely with lumbar swelling and general toxæmia

Treat: (A) *Unilateral pyonephrosis*:

(1) Removal of etiology

+ (2) **Drainage**:
- (a) Ureteral catheter
- *or* (b) Nephrostomy
- *or* (c) Suprapubic cystostomy

↓ (3) **Nephrectomy**:

Ind (a) Second kidney healthy
- (b) General condition good
- (c) Complete disorganisation

(B) *Bilateral pyonephrosis*:

(1) Removal of etiology

↓ (2) Drainage.
- (a) Suprapubic cystostomy
- (b) Bilateral nephrostomy

(3) **No nephrectomy**

(D) CARBUNCLE KIDNEY:

Def: Multiple suppurative foci throughout the kidney tissue secondary to pyæmia due to a pyococcal cutaneous lesion

Etio: (a) Age: 30-50
(b) Predisp.: **Furuncle or carbuncle**

Path: Multiple minute abscesses in the kidney tissue

Clinic: (1) Presence of etiology: furuncle
(2) Persistent pyrexia
(3) Unilateral lumbar tenderness
(4) Leucocytosis

Compl: Pyæmia

Treat: (1) Conservative:
: Antipyococcal general treatment
(2) Operative·
(a) Excision: partial nephrectomy
(b) Nephrectomy

(E) PERIRENAL SEPSIS:

(1) PERINEPHRITIS:

Def. Chronic fibro lipomatous inflammation within the perinephric sheath

Types. (A) Sclerotic. adhesions
(B) Fibro lipomatous: altered fat

(2) PERINEPHRIC ABSCESS:

Def: Pus in the perinephric cellular tissues

Etio: (a) Adult men
(b) Right side

Causes (A) **Primary:** Hæmatogenous
Etio: Furunculosis
Path Pyæmic abscess
(B) **Secondary:**
(a) **Kidney lesions:**
(1) Trauma → perirenal hæmatoma
(2) Kidney suppuration:
(α) Renal calculus
(β) Pyelonephritis
(γ) Pyonephrosis
(δ) Abscess or infarct
(b) **Neighbouring lesions:**
(1) Appendix
(2) Colon
(3) Ureter
(4) Pelvic organs
(5) Spine or ribs
(6) Pleura

Sources of infection
- (1) Renal
- (2) Perirenal organs
- (3) Local
- (4) Distant pyæmic

Path types (1) Acute pyococcal
- (2) Chronic tuberculous

Anatomy (1) **Supra nephric**
- Intra thoracic or sub phrenic
- (2) **Sub nephric**
  - (*a*) Retrocæcal appendix
  - (*b*) Iliac lymphadenitic abscess
- (3) **Ante nephric**
- (4) *Retro nephric* Most common
  - (*a*) Local causes
  - (*b*) Distant causes
  - (*c*) Regional causes

Bacterio (*a*) Pyococci staphylo or strepto
- (*b*) B coli
- (*c*) B tuberculosis

Clinic types (1) Acute 10 days
- (2) Sub acute 3 4 weeks
- (3) Chronic months

Clinic (A) **Acute perinephric abscess**
- (1) *Local signs*
  - (*a*) Pain
  - (*b*) Spasm
  - (*c*) **Swelling**
  - (*d*) **Costo vertebral tenderness**
  - ↓ (*e*) Superficial inflammation
  - + (*f*) Fluctuation
- (2) *Pressure or regional signs*
  - (*a*) Supra nephric
    - (α) Jaundice (personal case)
    - (β) Ascites
    - (γ) Basal pleurisy
  - (*b*) Sub nephric
    - (α) Psoas irritation
    - (β) Testis retraction
  - (*c*) Retro nephric
    - **Œdema and fullness in loin**
  - (*d*) Ante nephric
    - Palpable anterior swelling
- (3) *General signs* Septic toxæmia
  - (*a*) **Pyrexia**
  - (*b*) **Blood examination**

(B) **Chronic perinephric abscess:**
- (a) Fullness in the loin
- (b) Bimanual palpation
  - Fluctuating swelling

(C) **Latent perinephric abscess:**
General toxæmia with no local signs

Special signs (1) Plain X Rays
Blurring of the psoas outline
(2) Sign of Mathe (Med Ann 1940)
Loss of mobility of the kidney between Trendelenburg and upright positions as shown by excretion pyelography
(3) Lateral retrograde pyelogram
- (a) Forward displacement of the kidney
- ↓ (b) Arch like appearance of kidney and ureter

Diff diag (1) **General infections:**
Typhoid, septicæmia
(2) **Local conditions.**
(A) **Intraperitoneal:**
- (a) Appendix
- (b) Cæcum
- (c) Gall bladder
- (d) Liver

(B) **Extraperitoneal·**
- (a) Kidney and ureteral affections
- (b) Retrocæcal appendix
- (c) Vertebral and rib affections
- (d) Psoas abscess
- (e) Iliac lymphadenitis

Compl (1) Rupture
- (a) Outside
- (b) Pleura
- (c) Peritoneum
- (d) Colon
- (e) Bladder

(2) Fistulæ
(3) Pressure syndrome
(4) Septic complications
Septicæmia, pyæmia

Treat (A) *General* antiseptic
- (a) **Sulphonamides**
- (b) Intravenous dyes
- (c) Vaccines or sera

(B) *Local*
(1) *Conservative*
Fomentations, hip baths
(2) *Operative*
- (a) Incision and drainage
- ↓ (b) Treatment of primary focus

(3) RENAL AND PERIRENAL FISTULÆ:

(A) **Urinary fistulæ:**

Varieties: (*a*) **Spontaneous;**
(α) Infective
(β) Malignancy
(*b*) **Traumatic**
(*c*) **Post-operative**

Etio. (1) **Urinary obstruction:** Stricture
(2) **Urinary sepsis:** Pyonephrosis
(3) **Nature of infection:** T.B.
(4) **F.B.:** Calculus

Diagnosis: (1) History of etiology.
(α) Renal or ureteral sepsis
(β) Perirenal abscess
(2) Urinary discharge: urea
(3) **Dye tests:** Intravenous or intramuscular
(α) Indigocarmine
(β) Methylene blue
(4) Pyelography

Treat. (1) Remove the etiology
(2) Drainage
. Of the pelvis by ureteral catheters
(3) Nephrectomy

(B) **Non-urinary fistulæ:**

Causes: (*a*) Empyema
(*b*) Appendicular abscess
(*c*) Tuberculous
(α) Vertebra
(β) Rib
(γ) Ileum
(δ) Sacro iliac joint
(*d*) Subphrenic abscess
(*e*) Carcinoma colon

Diag (1) Pyelography
(2) X Ray after opaque injection.
. (Fistulography)

(V) RENAL TUBERCULOSIS:

Etio: Sex: women
Age: young adults
Side: *Unilateral, right side*
Incidence: 30% of surgical lesions of the kidney

Path: (A) Primary **Hæmatogenous**
(B) Secondary **Ascending**
(*a*) Ureteral
(*b*) *Lymphatic*

Morb. anat: (1) **Miliary**
(2) **Ulcero cavernous:** Pyelonephritic

(3) Ulcerative
(4) **Massive caseous**
(5) Hydronephrotic
(6) **Pyonephrotic**
(7) Pseudo calculous
(8) Nephritic
Parenchymatous and interstitial
(a) Primary tuberculous
(b) Secondary toxic
(9) **Bacilluric**
(10) **Perinephric abscess** :
(a) Renal T B
(b) *Extra renal T B*
(α) *Spine*
(β) *Ribs*
(γ) *Ileum*
(δ) *Sacro iliac joint*
(11) Adhesive perinephritis and peri ureteritis

Clinic (1) **Vesical syndrome** :
(a) Diurnal frequency
(b) Vesical tenesmus
(2) **Urine changes** :
Poly hæmat pyuria (*acid sterile pyuria*)
(3) Local syndrome
Pain + swelling
(4) **Associated lesions** :
(a) Lower genito urinary focus
(α) Prostate
(β) Testis
(γ) Ureter
(b) Chest
(c) Lymph glands
(5) General tuberculous toxæmia

Special signs
(1) **Urine examination for T. B** :
(a) Microscopical 72% positive
(b) Cultural 98% positive
(2) **Cystoscopy : Ureteric orifice**
(a) Hyperæmia
↓ (b) Swollen ureteric orifice
↓ (c) Tubercles round about
↓ (d) *Golf hole orifice*
(3) Chromo-cystoscopy
Delay in appearance of the dye
(4) Ureteric catheterisation of the sound side
To find the state of the sound kidney
(5) **Pyelography : Intravenous**

(A) *Abnormal outline*
(a) Irregular or *moth eaten pelvis*
(b) Renal cavitation or abnormal shadow
(c) *Irregular ureter*
(B) Delay in excretion
(6) Presence of a primary tuberculous focus
(a) Urinary
(b) Genital
(c) Extra urogenital
(7) Guinea pig test 94% positive

Compl (1) Urinary sepsis
(2) Uræmia
(3) Spread to lower urinary organs
• **Cystitis** and then to the other side
(4) T B toxæmia

Treat (A) *Radical*
: **Nephrectomy + ureterectomy**
Ind Unilateral primary renal T B
Contra (a) Bilateral renal T B
(b) Inefficient other kidney
(c) Tuberculosis elsewhere
(d) General low condition
Special tech (a) Carbolisation of cut ureteral stump
(b) Free the kidney outside perirenal fascia
(c) Carbolisation of cut renal pedicle
Post compl Unhealing sinus
Treat Ureterectomy

(B) *Conservative*
Ind (a) Nephrectomy contraindicated
(b) Post operative
Tech General anti tuberculous treatment

(VI) RENAL CALCULUS: (See under Lithiasis)

Def An agglomeration of crystals held together by irreversible colloid

Etio Average age 38 years (adults)

Causative factors

(A) **Primary stones:**
(1) **Metabolic errors**
(a) Congenital (α) Urate and uric acid
(β) Cystinuria
(γ) Phosphaturia
(b) Acquired hyper parathyroidism
(2) **Dietetic errors:**
(a) Lack of vitamin A
(b) Abnormal fluid intake
(α) Hard water
(β) Less water

(3) **Geographical factor:**
Sandy and dry countries
(4) Prolonged immobilisation
Leading to skeletal decalcification

(B) **Secondary stones:**

(1) **Urinary obstruction:**
↓ (*a*) Urinary stagnation
↓ (*b*) Precipitation of salts due to
(α) Concentration
(β) Change in chemical reaction
(γ) Inflammation

(2) **Urinary sepsis**

athology (A) **Precipitation of salt:** Due to
(*a*) Excess
(α) Metabolic hyper parathyroidism
(β) Concentration stagnation
(*b*) *Change in chemical reaction*
(c) Bacterial fermentation
(*d*) Congenital urates and uric acid

\+ (B) **Presence of irreversible colloid:** Fibrin

\+ (C) **Nucleus·**
(*a*) Chemical
(α) Ammon urate in infants
(β) Uric acid in adults
(γ) Calc. oxalate in old
(*b*) F B blood clot, bacteria, etc.

Compos (1) **Calcium oxalate·** Most common
Etio (*a*) Hyperchlorhydria
(*b*) Faulty diet
Morb anat *Spiculated mulberries*
Clinic Early symptoms
Sign Good X Ray shadows

(2) **Uric acid:**
Morb anat *Shaligrams*
Single or multiple
Sign *No X Ray shadows*

(3) **Urates:**
Etio Children
Morb anat Soft, yellow, friable
Multiple
Sign *No X Ray shadous*

(4) **Calcium phosphate:**
Morb. anat Hard, irregular, greyish white
Sign. Good X Ray shadows

(5) **Triple phosphates:** Common
Etio Urinary stagnation + *sepsis*

Comp (*a*) Calcium phosphate
+ (*b*) Ammonium phosphate
+ (*c*) Magnesium phosphate

Morb anat *Friable, large, stag horn*
Sign Decomposed alkaline urine

(6) Cystin

Morb anat Yellow → olive green waxy
Sign Cystinuria

(7) Xanthin
(8) Indigo
(9) Fibrin

(A) *Primary constituents*
(1) **Oxalates** Diet
(2) **Uric acid and urates.**
Congenital metabolic errors

(B) *Secondary constituents*
(1) **Calcium:**
(*a*) Acquired metabolic errors
or (*b*) Local inflammation
(2) **Phosphates:**
Alkaline reaction

Sites (1) Kidney tissue silent stones
(2) Calyces
(3) Kidney pelvis

Clinic (A) *Silent stones* kidney tissue stones
(*a*) Accidental X Ray finding
(*b*) Accidental operative finding

(B) *Renal calculus syndrome*
(1) **Pain:**
(*a*) Fixed lumbar pain
(*b*) Renal colic → strangury
(*c*) Referred to
(1) Bladder tenesmus
(2) Tip of the penis
(3) Testis
(4) Thigh, foot, heel
(5) Other kidney
(2) **Hæmaturia:** With strangury
(3) **Abnormal micturition:**
Frequency, strangury, difficulty
(4) History of lithiasis

Signs (1) **Urine examination.**
(*a*) Hæmaturia
(*b*) Pyuria
(*c*) Crystaluria
(2) **X-Rays:** Of the whole urinary tract
(*a*) Ordinary in two planes

(b) Pyelography
(α) Excretory
(β) Instrumental or ascending
(3) **Cystoscopy**
(4) **Renal function tests**

Diff diag *Of an opaque shadow*
(a) Calcareous lymph gland
(b) Phlebolith
(c) Enterolith
(d) Calcification or ossification
(e) Gall stones

Diff diag *Of renal calculus*
(1) *Renal*
(a) **Lithiasis** Crystaluria
(b) T B
(c) Hydronephrosis
(d) Pyelitis or pyelonephritis
(e) Movable kidney
(f) Renal growths
(g) Polycystic kidney
(2) *Other organs*
(a) Gastro duodenal lesions
(b) Intestinal lesions
(c) Gall bladder lesions
(d) Appendicular lesions
(e) Spinal lesions
(f) Psoas lesions

Compl (1) **Migration** Renal and ureteral colic
(2) **Obstruction'**
(A) **Calculous anuria**
Acute and complete obstruction
Def Suppression of urine due to failure of function of both the kidneys
Causes (1) Bilateral stone impaction
(2) Unilateral stone impaction
+ Reflex inhibition of other kidney
(3) Unilateral stone impaction
+ Inefficient other kidney
Clin c (a) **Stage of onset**
(α) Renal colic + hæmaturia
↓ (β) Anuria
(b) **Stage of tolerance**
(α) Absence of micturition
(β) Empty bladder
(γ) No general toxæmia
(c) **Stage of uræmia**

(α) Nervous:
Headache, insomnia, delirium, hallucinations, convulsions, drowsiness, coma

(β) Digestive
Anorexia, thirst, hiccough, parrot tongue, vomiting, distension, constipation, diarrhœa

(γ) Muscular
Twitchings, convulsions

Signs (1) **Easy passage of a catheter in an empty bladder**

(2) **X-Rays.**
Stone in ureter or pelvic outlet

(B) **Hydronephrosis:**
Chronic and incomplete obstruction

(C) **Stricture ureter**

(3) **Infection.**
- (a) Pyelitis
- (b) Pyelonephritis
- (c) Pyonephrosis
- (d) Perinephritis
- (e) Perinephric abscess
- (f) Renal fistulæ

(4) **New growths:** (Association in 50% of cases of epidermoid carcinoma of pelvis)

Diagnosis All symptoms of urinary stones are
(a) Increased by movements
& (b) Decreased by rest

Treatment (A) *Prophylactic* removal of the etiology
- (a) Metabolic and dietetic
- (b) Plenty of fluids
- (c) Treatment of
  - (α) Urinary obstruction
  - (β) Urogenital sepsis

(B) *Symptomatic*

(1) **Renal colic.**
- (a) Hot hip bath
- (b) Atropine (*no morphia*)

(2) **Hæmaturia:**
- (a) Rest and morphia
- (b) Coagulants
- (c) Local ice bag

(3) **Calculous anuria:** Period of tolerance
- (a) Distension of bladder with warm lotion

↓ (b) Radiography
↓ (c) Cystoscopy
↓ (d) **Ureteral catheterisation :**
(α) Displace the impaction
(β) Pelvis drainage
+ (e) Continuous intravenous therapy
(α) **Sodium sulphate**
(β) Glucose saline
+ (f) Fluids, alkalies, diuretics
↓ (g) **Nephrostomy :**
Ind Failure of conservatism
Site (a) Site of last pain
(b) Sign de Legueu
Spasticity over kidney
(c) X Ray evidence
Post treat Continuous intravenous sodium sulphate and glucose

(C) *Calculus treatment proper*
(1) *Medicinal*
Ind (a) In association with other treatment
(b) Bilateral calculi
(c) Small scattered stones
Tech (See under Lithiasis)
(a) Diuretics fluids & alkalies
intravenous soda sulph
(b) Antiseptics hexamine group
(c) Dietetic Avoidance of
(α) Oxaluria Berries
Tomatoes
Rhubarb
(β) Uric acid Kidney
Liver
Brains
(2) *Instrumental* (See under Ureters)
(3) *Operative*
Ind (a) Repeated pain
(b) Continued hæmaturia
(c) Appearance of complications
Contra (a) Extensive bilateral metabolic calculi
(b) Renal failure with uræmia
(c) Very small and multiple shadows
(d) Poor general condition
Tech (A) *Unilateral cases*
(1) **Nephro lithotomy :**
Ind (a) Large branched stone with healthy kidney
(b) Collection of stones in dilated calyx

(2) **Pyelo-lithotomy:**
Ind (a) Moderate stone in pelvis
(b) Few small stones in a calyx or calyces
(3) **Partial nephrectomy:**
Ind Stone in a shut off calyx
(4) **Total nephrectomy:**
Ind (a) Primary
(1) Hydro pyonephrosis
(2) Renal atrophy
(3) Renal malignancy
(4) Very big stone
(5) Multiple stones
(6) Hæmaturia or pyuria
or (b) Secondary
(1) Recurrent stones
(2) Nonhealing fistulæ
(3) Prolonged sepsis
\+ (c) Always
Second kidney healthy

(B) *Bilateral cases*
Ind (a) Expectation of renal function recovery after stone removal
(b) One side advanced than the other
Contra Both kidneys inefficient
Tech Two stage nephrolithotomy
(a) Better side operation
↓ (b) 6 months
↓ (c) Other side operation

Post compl
(1) Hæmorrhage
(2) Shock
(3) Paralytic ileus
(4) **Urinary sepsis**
(5) **Acute uræmia**
Sequelæ (1) **Perirenal fistulæ**
(2) **Recurrences**
(3) **Chronic uræmia**
(4) Lumbar scar hernia

(VII) POST-TRANSFUSION NEPHRITIS:

Etio Previous existing nephritis
Clinic (a) Stage of alarm
↓ (b) Stage of anuria or oliguria
↓ (c) Stage of polyuria
↓ (d) Terminal stage
(α) Uræmia
or (β) Recovery
Treat (1) Intravenous soda bi-carb
(2) Decapsulation

(VIII) RENAL NEOPLASMS:

(A) RENAL PELVIS TUMOURS

Varieties: (a) *Benign*.

(1) **Angiomata:**
Painless, profuse hæmaturia

(2) **Papillomata:**
(a) Painless, profuse hæmaturia
(b) Pelvic obstruction
(c) Implantation
Along the lower urinary organs
(d) Malignant degeneration

(b) *Malignant*

(1) **Papillary carcinoma:**
Infiltrating papilloma

(2) **Epidermoid carcinoma:**
(a) Squamous leukoplakic
(b) Associated with calculus > 50%

Symptoms (1) **Pain:** (a) Lumbar
(b) Renal colic

(2) **Hæmaturia** (a) *Pronounced*
(b) *Persistent*
(c) *Painless*

(3) **Tumour:** (a) Hydronephrosis
(b) Hæmonephrosis
(c) Pyonephrosis

Signs (1) Cystoscopy (a) Bloody efflux from ureter
(b) Ureteral prolapse
(c) Visible growth in bladder

(2) Pyelography (a) Excretory
(b) Instrumental

(B) RENAL TISSUE TUMOURS

Varieties (1) *Adult age*

(A) **Adeno carcinoma:**

Synonym (α) Hypernephroma
(β) Grawitz tumour

Etio Age 30–50
Unilateral

Path Carcinoma of Wolffian body

Morb anat Polar, cortical, adrenal like, yellowish red coloured, encapsuled, lobulated and variegated on cut surface.

Metastases (a) Along renal vessels
(b) Along perirenal tissues

(2) **Pyelo-lithotomy:**
Ind (a) Moderate stone in pelvis
(b) Few small stones in a calyx or calyces

(3) **Partial nephrectomy:**
Ind Stone in a shut off calyx

(4) **Total nephrectomy·**
Ind (a) Primary
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(α) Uræmia
or (β) Recovery
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(2) Decapsulation

(2) **Tumour**: (*a*) Unilateral
(*b*) Bilateral
(3) Metastases by local infiltration
(4) **Cachexia**

(C) **General signs**:
(1) Pain (*a*) Clot colic
(*b*) Tension pain
(*c*) Neuralgia
(2) Urine Blood, pus, growth
(3) Cachexia

Signs *Of renal tissue tumours*
(1) Urine examination
(2) **X-Rays**: (*a*) Plain abdomen, chest, bones
(*b*) Pyelography
(α) Excretion
(β) Instrumental
Renal shadow deformity
(3) **Cystoscopy**
(4) Kidney function tests
(5) **Exploration**

Diff diag (1) Renal affections
(2) Suprarenal growths
(3) Liver or spleen enlargements
(4) Retroperitoneal malignancy

Treat (1) **Radical nephrectomy**:
Ind (*a*) Other kidney efficient
(*b*) Local operability
(*c*) General condition good
Contra (*a*) Local infiltration + +
(*b*) *Distant secondaries*
(*c*) Inadequate other kidney
(*d*) Cachexia
(*e*) General condition bad
Tech Nephrectomy with perirenal fat and upper *ureter, by abdominal or lumbar route*

(2) **Irradiation**:
Ind (*a*) Pre operative
(*b*) Post operative
(α) Preventive
(β) Recurrences
(*c*) Substitutive
Inoperable cases

(IX) RENAL OPERATIONS:

(1) *Pre operative investigations*

(A) **Estimation of renal efficiency**:
(See under Chapter 1)

(B) **Estimation of circulatory efficiency**:

(c) Blood: (α) Liver
(β) Lungs
(γ) Bones

(B) **Carcinoma:**
Path: (α) Alveolar
(β) Adeno
(γ) Papillary: malignant papilloma

(C) **Sarcoma**

(2) *Children:*

: **Renal adeno-sarcoma:**

Synonym (*a*) Mixed embryonic tumour
(*b*) Wilms' tumour

Etio (*a*) Congenital: bilateral
(*b*) 1–4 years: unilateral

Path: Mixed tumour composed of all the tissues, derived from embryonic misplaced rudiment

Metastases (*a*) Direct infiltration
(*b*) Blood

Morb anat. (*a*) Epithelium
(*b*) Connective tissues: Cartilage
: Bone
: Muscle

Clinic (1) Rapidly progressive, large, irregular renal tumour
+ (2) Cachexia
+ (3) Age. below 4 years

Diff. diag (*a*) Congenital hydronephrosis
(*b*) Congenital cystic kidney
(*c*) Suprarenal growths
(*d*) Enlarged spleen or liver

Treat (1) Irradiation
↓ (2) Surgical removal
↓ (3) Irradiation

Clinic. *Of renal tissue tumours:*

(A) **Grawitz tumour:**
(1) **Age: After 40**
(2) **Hæmaturia**
(3) Rapidly oncoming varicocele: After 35
(4) Metastases in (*a*) Lungs
(*b*) Bones
(5) Hyperpiesia
(6) Fever. 99°–104°

(B) **Wilms' tumour:**
(1) **Age:** (*a*) Congenital
(*b*) Infantile
(*c*) **Children below 4**

(c) **Spinal**
(d) General . (α) Inhalation
(β) **Intravenous evipan**

Position : (1) **Lateral** on the sound side :
With : (a) Flexion of lower hip and knee
+ (b) Extension of upper hip and knee

or (1) **Prone**
+ (2) Stuffing under the loin :
(a) Air cushion
(b) Sand bag
(c) Kidney rest

(A) EXPLORATION :

Ind : (a) Profuse renal hæmaturia
(b) Renal pain
(c) **Renal tumour**
(d) **Renal sepsis**
(e) **Renal calculus**
(f) Obstructive anuria
(g) Decapsulation

Tech . (1) **Incisions :** Posterior or lumbar route
(A) **Morris :**
. Costomuscular angle
↓ Ant sup iliac spine
(B) **Mayo :** L shaped
(a) Vertical over erector .
From 12th rib for 3"
↓ (b) Parallel to and near iliac crest
(C) **Thomson-Walker :**
(a) Vertical over erector :
. From 12th rib
↓ (b) Horizontal midway between last rib & iliac crest

↓ (2) Division of muscles .
(a) Lat dorsi + serratus post. inferior
↓ (b) External and internal oblique

↓ (3) Incision of lumbar fascia :
: At the lateral border of quad. lumb.
. (*Save 11th intercostal vessel & nerve*)

↓ (4) Separation of peritoneum :
: From transversalis fascia

↓ (5) Incise perirenal fascia of Zuckerkandl

↓ (6) Isolation of the kidney with its pedicle :
: By blunt dissection all around

(a) Heart
(b) Arteries
(c) Blood pressure

(C) **Estimation of general condition:**
(a) Blood. (α) Hæmoglobin
(β) Coagulation
(b) Nervous system
(c) Metabolism

(2) *Pre-operative treatment:*

(A) *Urinary:*
(a) **Diuretics:** Hydrotherapy
(b) **Antiseptics:** ℞
Hexamine grs x before meals
+ ℞
Acid phosph dil. m. viii
Acid nitrohydrochlor dil. m viii
Liquor strychnini m iii
Spt chloroformi m. x
Inf. gentianæ co ad ounce ½
T. D. S after meals
(c) **Preliminary drainage with lavage:**
(α) Urethral
(β) Suprapubic

(B) *Alimentary.*
(a) **Diet:** Light nutritious food
Plenty of barley and sugar
(b) **Laxatives:** Cascara evacuant
Every night for two weeks
(c) **Antiseptics:** Carbon, salol, bismuth

(C) *Circulatory*
(a) **Heart tonics:** digitalis
(b) **Hæmatinics**
(c) **Blood coagulants**

(D) *Anti acidosis.*
: Glucose, soda bi carb, salines

(E) *Respiratory*
(a) Correction of any pre existing disease
(b) Anti pneumonic prophylaxis
(c) Anti-catarrhal vaccines

(F) *General.*
(a) **Blood transfusion**
(b) Correction of metabolic diseases
(c) Tonics

(3) *Operative technique.*

Anæsth: (a) Local
(b) Regional. paravertebral

(5) Isolation of incision field by packs
(6) Incision in the long axis of the pelvis
(7) Removal of the stone
(8) Inspection of the stone
(a) Fracture
(b) Facets
(c) Comparison with X Ray picture
(9) Search for other stones
In (a) Pelvis
(b) Calyces
(c) Ureter
(d) Renal tissue
(10) Passage of a ureteric catheter down into the bladder
(11) Suture of the pelvic incision
Cover with fibro fatty layer
(12) Drainage tube in perinephric area
(13) Closure

If the kidney cannot be delivered but pelvis is accessible

(a) No suture of the pelvis
+ (b) Wide bore drainage

(2) NEPHRO-LITHOTOMY

Ind Stone in the renal tissue

Tech (1) Exposure and deliverance of kidney
(2) Digital compression of renal pedicle
(3) Search for the stone by
(a) Palpation
(b) Needling
(c) Probing
(d) Incision
(4) Passage of a guide upto the stone
(5) Incision along the guide
(6) Extraction of the stone
(7) Examination of the stone
(8) Search for all other stones
(9) Closure
With (a) Pelvic drain if sepsis
(b) Perinephric drain

(D) NEPHROPEXY (Thomson-Walker)

Tech (1) Clearance of fat from post abd wall
(2) Posterior decapsulation of the kidney
(3) Three sutures of no 4 catgut
Between (a) Kidney
And (a) Angle of 12 rib and erector spinæ

↓ (7) Deliver of the kidney outside wound
↓ (8) Exploration
of (a) The kidney
(b) The pelvis
(c) The ureter
by (1) Inspection
(2) Palpation
(3) Probing
(4) Incision
↓ (9) Treatment of the focus
↓ (10) Closure
(a) Muscles
Interrupted no 3 chromic catgut
(b) Fascia
Continuous no 2 chromic catgut

Alter tech (Hamilton Bailey Emergency Surgery)
(1) Vertical incision of erector spinæ sheath
↓ (2) Medial retraction of erector spinæ
↓ (3) Vertical incision of deeper layer of the sheath
↓ (4) Medial retraction of quadratus lumborum
↓ (5) Lateral retraction of extraperitoneal fat
↓ (6) Tear through the fascia of Zuckerkandl

(B) NEPHROSTOMY

Ind (1) Calculous anuria
(2) Pyelonephritis
(3) Hydronephrosis

Methods (1) Bailey s diathermy method
(2) Cabot s method

Tech (1) Exposure
(2) Incision just behind the convex border
(3) Passage of finger in renal pelvis
(4) Put in a tube and stitch it to the capsule
(5) Corrugated rubber in perinephric area
(6) Closure

(C) LITHOTOMY

(1) PYELO LITHOTOMY

Ind (a) Stone free in renal pelvis
(b) Stone in calyx opening in the pelvis
(c) Stone in upper end of ureter
With (d) Kidney capable of delivery

Tech (1) Exposure
(2) Deliver the kidney out of the wound
(3) Clearance of post. wall of the pelvis
(4) Milking, isolation & fix. of stones

Contra (1) Inoperable malignancy
(2) General contraindications
(3) *Contralateral renal inadequacy*

Tech (A) **Lumbar Nephrectomy** :
(1) Exposure
(2) Examination of the focus
(3) Assessment of indications and contraind
(4) Isolation, ligature between clamps and division of the ureter, with carbolisation of lower stump
(5) Isolation of kidney and its pedicle. By blunt dissection on all sides
(6) Transfixion ligature of the renal pedicle
by (a) Pedicle needle
(b) Clamping
(c) *Double ligature on proximal side*
with No 4 catgut or silk
or (6) Clamp & ligate individual vessels As close to the kidney as possible
(7) Division of the pedicle
(8) Removal of the kidney
(9) Closure with drainage

(B) **Transperitoneal nephrectomy:**
Ind (a) Very large renal tumours
(b) Associated intraperitoneal trauma
Tech (1) Incision
(a) T shaped
(α) Paramedian
+ (β) 11th rib to 2 above umb
(b) Transverse
Umbilicus to tip of 12th rib
(2) Division & retraction of abd muscles
(3) Peritoneal incision
(4) Peritoneal exploration
(a) Liver
(b) Renal pedicle
(c) Peritoneal cavity
(d) Other kidney
(5) Packing off the operation area
(6) Incision of post. peritoneum
Outer side of the colon
(7) Stripping of the peritoneum inwards
(8) Ligate & divide ureter & renal vessels
• As far away from kidney as possible

(β) Outer edge of quad lumb
(γ) Outer edge of quad lumb

(E) RENAL DECAPSULATION

Syn Edebohls s operation
Ind (a) Acute or subacute parenchymatous nephritis
With threatened uraemia
(b) Suppurative pyelonephritis
(c) Nephritis dolorosa
(d) Acute post scarlatinal nephritis
(e) Hæmorrhagic nephritis
Anæsth Local infiltration
Position Completely prone
Tech (1) Lumbar incision
(2) Isolation of the kidney
(3) Incision of the capsule
Along the convex border
(4) Peeling off of each leaf towards hilum
(5) Closure with drainage
(6) Repeat on other side

(F) NEPHRECTOMY

Second kidney must be healthy

Ind (1) **Renal tuberculosis:** Unilateral
(2) Calculus
(a) **Large and multiple stones.**
(b) Atrophy of the kidney
(c) Septic complications
(α) Pyonephrosis advanced
(β) Fistulæ inveterate
(γ) Secondary hæmorrhage
(d) Recurrences
(e) Malignancy
(3) Hydronephrosis advanced
(4) **Pyelonephritis or pyonephrosis:**
Advanced
(5) **Malignancy:**
Where no contraindications
(a) Grawitz
(b) Wilms
(c) Carcinoma
(d) Sarcoma
(6) Urinary perirenal inveterate fistulæ
(7) **Trauma to the kidney:**
(a) Rupture or penetrating wound
(b) Uncontrollable hæmorrhage
(c) Advanced sepsis
(8) Carbuncle of the kidney
(9) Aneurysm of the renal artery

(a) Diuretics
(b) Urinary antiseptics
(c) Tonics

℞/	Tr. ferri perchlor	m x
	Acid phosph dil	m viii
	Acid nitrohydrochlor dil	m viii
	Liquor strychnini	m iii
	Spt chloroformæ	m x
	Aqua	ad ounce ½

(6) **Bowels:**
(a) First 48 hours
Flatus tube
(b) At the end of 48 hours
(1) Simple enema
↓ (2) Turpentine or ox gall enema
↓ (3) Repeat 8 hours after
↓ (4) Laxatives by oral route every night
+ (5) Enema every morning
(c) If flatulence and vomiting
(1) Draught of hot water with a tea spoonful of soda bi carb
(2) Tr iodine m iv in half a glass of water Every half an hour
(3) Mist pepsinæ c morphinæ co. Drachm ½ every hour
(4) Adrenaline chloride m x In half a glass of water every hour
(5) Stomach lavage with soda bi carb sol

(7) **Post-operative insomnia:**
(a) First 24 hours
(α) Morphia
(β) Rectal aspirin + bromide in glucose saline
(b) After 48 hours
(α) Medinal grs. 7½
(β) Empirin co grs 10
(γ) Soneryl

(8) **Retention of urine:**
(a) Change in position
(b) Hydrotherapy
(c) Suprapubic fomentations
(d) Catheter drain
+(e) Intravenous soda sulph

(9) **Post-operative hiccough:**
(a) Tr iodine in minim doses
(b) Adrenaline in minim doses
(c) Morphia ¼ gr + atropine 1/100 gr.
(d) Gastric lavage
(e) CO_2 inhalations

(9) Isolation and removal of
- (a) Kidney with its pedicle
- (b) Suprarenal gland
- (c) Perinephric fat
- (d) Ureter
- (e) Covering peritoneum

(10) *Stab drain*
At the outer border of quad lumb

(11) Suture of the post peritoneum

(12) Closure of the abdomen

(C) Partial nephrectomy

Ind (a) Bifid kidney and pelvis
With one part diseased
(b) Laceration of the kidney
(c) Polar carbuncle or stone

Tech (1) Exposure
(2) Temporary control of the pedicle
Manual pressure
(3) Wedge shaped resection
(4) Deep mattress sutures
- (a) No 2 chromic catgut
- (b) Interposed muscle graft

(5) Capsule suture
Continuous no 1 chromic catgut
(6) Closure with drainage

(4) *Post operative treatment*

(1) ***Position*** ·
- (a) Ease the tension on the wound
- (b) Drainage tube to be lower most

(2) **Post-operative pain** ·
- (a) Rectal saline ounces 10
  - Glucose 5%
  - Pot Bromide grs 40
  - Aspirin grs. 30
- (b) Morphia ¼ gr or heroin ⅛ gr
- (c) Empirin Compound grs. 10
  At 6 hourly intervals after 24 hours

(3) **Post-operative shock**
- (a) Preliminary blood transfusion
- (b) Delicate handling
- (c) Usual anti shock treatment

(4) **Fluids** ·
- (a) Oral
- (b) Rectal
- (c) Subcutaneous
- (d) Intravenous

(5) **Medicines:**

(a) Diuretics
(b) Urinary antiseptics
(c) Tonics

℞ Tr ferri perchlor — m x
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(e) CO_2 inhalations

(6) *Signs and symptoms of abnormal renal mobility and renal calculus are aggravated by movements and relieved by rest.*

(7) Main factor which keeps the kidney in its normal position is adequate intra abdominal pressure maintained by tonic contraction of the abdominal muscles

(8) Every mobile kidney is a potentially pathological kidney and hence requires attention

(9) *In uric acid stones, keep the urine alkaline, in phosphatic stones, keep the urine acid, in oxalate stones, no chemical treatment is indicated*

(10) *Clinical types of renal affections*
- (a) *Painful type*
  - (α) Local
  - (β) Referred
- (b) *Tumour type*
- (c) *Inflammation type* urinary sepsis
- (d) *Obstruction type*
  - (α) Anuria acute
  - (β) Chronic uræmia
- (e) *Bladder type*
  - (α) Cystitis
  - (β) Distension
- (f) *Urinary type* abnormal urine
- (g) *Micturition type* abnormal micturition
  - (α) Tenesmus or strangury
  - (β) Retention
  - (γ) Incontinence
  - (δ) Frequency
- (h) *Latent type* symptomless

(11) *Renal disease complications*
- (a) *Urinary colic*
- (b) *Urinary obstruction*
  - (α) Local effects colic
  - (β) Systemic effects anuria
  - (γ) General effects uræmia
- (c) *Urinary infection*
  Descending urinary infection
- (d) *Stone formation*
- (e) *New growth*
- (f) *Metabolic changes*
  - (α) Uræmia
  - (β) Arteriosclerosis
  - (γ) Hyperpiesia

(12) Hæmaturia following an accident with no local or general signs should be put to bed with pulse chart, being given

(a) Urinary antiseptics
& (b) Blood coagulants

(13) *In every case of hæmaturia due to renal trauma, every specimen of urine should be saved and stored in glasses, bearing labels indicating time of voiding*

(14) Urinary tuberculosis is secondary to tuberculosis elsewhere in the body, pulmonary lesions are found in over 50% of cases

(15) *Within 24 hours or even less of a severe injury to the kidney, considerable meteorism is usual due to associated bruising of the colon*

(16) Nephrectomy is necessary in majority of those cases of kidney trauma which are severe enough to merit urgent exploration

(17) *Treatment of*

(1) *Hyperemesis gravidarum*
(2) *Eclampsia*
(3) *Pregnancy pyelitis*

is (a) *Ureteral catheterisation*
+ (b) *Continuous intravenous sod sulph*

(18) Etiology of female pyelitis

(A) Pregnancy upper urinary stasis
(B) Puerperium lower urinary stasis

(19) Tuberculous kidney

(a) Frequent micturition
(b) Painless hæmaturia or dysuria
(c) Pyuria

(20) *Most common causes of anuria*

(a) *Impacted calculus*
(b) *Urinary operation*
(c) *Sudden relief of acute retention*
(d) *Pregnancy with eclampsia*
(e) *Pelvic carcinoma*
(f) *Bilateral ureteral trauma in hysterectomy*

(21) Calculous anuria is complete suppression of urine directly or indirectly due to a calculus

(22) Diaphoretics are useless and even harmful in anuria, what the patient requires is a diuretic

(23) In 99 out of 100 cases where a kidney is the only organ damaged the rupture is extraperitoneal and lumbar exposure is advisable

(24) *Congenital absence of one kidney occurs sufficiently frequently to make it imperative to ascertain the presence of second organ before a nephrectomy*

(25) Methods of finding of a second healthy kidney:
(a) External palpation under anæsthesia
(b) *Excretion pyelography*
(c) Chromo cystoscopy
(d) Trans abdominal intraperitoneal palpation

(26) First nephrolithotomy was done in 1889 by Sir Henry Morris on a domestic servant

(27) Three routes of kidney infection
(a) Descending hæmatogenous
(b) Ascending urinary
(c) Infiltrating from neighbours.

(28) *Very high temp out of all proportions to the pulse in*
(a) *A child*
(b) *Pregnant woman*
(c) *Lower urinary focus*
(d) *Distant pyogenic focus*
? *Pyelitis or pyelonephritis*

(29) In renal infections
(a) Acid urine
(α) B coli
(β) Streptococcus
(b) Alkaline urine
(α) Staphylococcus
(β) B proteus

(30) Hæmatogenous or primary chronic pyelonephritis is commonly unilateral but reverse applies to ascending or secondary variety, which, in the majority of cases, is bilateral

(31) Dysuria, hæmaturia or costo vertebral pain in pregnancy with pyuria diagnose pregnancy pyelitis.

(32) *Coli bacilluria in pregnancy has been found in 90% of cases*.

(33) Combination of urinary stagnation and infection is responsible for high incidence of pyelonephritis during pregnancy or puerperium

(34) Pyelonephritis of puerperium is always secondary to pyelonephritis of pregnancy

(35) *Do not wait for fluctuation in perinephric abscess, explore as soon as the condition is strongly suspected*

(36) When a kidney is removed, atrophy of the first interspace of the hand between the thumb and the index finger on the same side takes place (Med Ann 1939)

(37) Preliminary nephrostomy saves many a life in pyonephrosis

(38) Etiology of perinephric abscess
(a) Renal
(b) Perirenal

(c) Regional surrounding organs
(d) Distant pyæmic
(α) Pyococcal
(β) Tuberculous.

(39) *No instrumentation should be done in any case of acute urinary tract infection or inflammation*

(40) Instrumentation or operative interference in a case of chronic lower urinary tract infection, may light up acute ascending pyelonephritis

(41) Nephrectomy is not indicated in ascending pyelonephritis, as it is commonly or potentially bilateral

(42) In cases of advanced urinary obstruction with or without infection, treatment should be in stages
(a) Drainage + antiseptics
(α) Medical
(1) Fluids
(2) Diuretics
(3) Urinary antiseptics
\+ (β) Catheter
(1) Urethral
(2) Ureteral
↓ (b) Bladder lavage
↓ (c) Operative interference

(43) *Routine bacteriological examination of the urine constitutes a most important part of ante natal care and should never be omitted*

(44) Later in pregnancy the pyelonephritis develops, the worse is the prognosis

(45) *Blood transfusion is dangerous in the presence of damaged renal epithelium*

(46) *Pyelitis in infants*
(A) *Acidification for three days*
(α) *Lactic acid 5 gm for each year of age*
or (β) *Phosphoric acid 2 m for each year of age*
↓ (B) *Alkalinisation for three days*
Soda bi carb

(47) Pyelitis of pregnancy begins at the sixth week in multiparæ and tenth week in primiparæ reaching its maximum in fifth month, it disappears slowly after delivery

(48) *As a preventive of pyelitis, the importance of high fluid intake during pregnancy cannot be over estimated*

(49) *Costo vertebral spasm and tenderness is of great diagnostic value in perinephric abscess*

(50) *Acute retrocæcal appendicitis and acute pyelitis simulate each other very closely*

(51) Absence of pus in urine within 12 hours of the onset of acute crisis makes the diagnosis of acute pyelitis improbable

(52) Indications for renal sympathectomy

(a) Nephralgia renal pain with no organic lesion
(b) Small painful hydronephrosis
(c) Essential hæmaturia
(d) Recurrent stones
(e) Renal hyperpiesia

(53) Renal tuberculosis starts as

(a) Pyelonephritis
or (b) Renal abscess

(54) *Kidney receives 300–450 c c s of blood per minute All blood in the body passes through the kidneys in a little over 10 minutes*

(55) *First symptom of renal tuberculosis is diurnal frequency*

(56) If pus is present in acid urine with sterile culture, T B kidney should be suspected

(57) *It is advantageous to both mother and child to remove a* T. B kidney in early months of pregnancy

(58) Operations of kidney are well borne by pregnant women

(59) Chief signs of T B kidney

(a) Frequency
(b) Dysuria
(c) Changes in urine

(60) *Pyuria, sterile and acid, is strongly suggestive of tuberculous kidney*

(61) It is unwise to catheterise the ureter on the affected side in tuberculous kidney because of the dangers of severe constitutional disturbance and secondary infection

(62) In tuberculous kidney, urine examination:

(a) Microscopic positive in 72%
(b) *Guinea pig test positive in 94%*
(c) Culture positive in 98%.

(63) Children with relapsing pyelitis and persistent pyuria may be suffering from tuberculous kidney

(64) In tuberculous kidney and bladder, no lavage is advisable

(65) No blood should be allowed to escape into the wound from the renal end of the renal vein in nephrectomy for T B or malignancy, as such blood may contain T B bacilli or malignant cells respectively.

(66) X Ray pictures in urinary stones

(a) Best shadows cystin stones
(b) Good shadows calcium oxalate

(c) Fair shadows
 (α) Calcium phosphate
 (β) Triple phosphates
(d) *No shadows*
 (α) *Uric acid*
 (β) *Ammonium and sodium urate*

(67) Negative shadow in a pyelogram
 (α) Uric acid stone
 (β) Urates stone

(68) *Cardinal symptoms of urinary stones*
 (a) *Pain*
 (b) *Hæmaturia*
 (c) *Effect of movements and rest*

(69) *Renal colic*
Characters (a) Abrupt start and end
 (b) Intermittency
 (c) Shooting in a certain direction
Clinic (1) Pain
 (2) Vomiting
 (3) Shock
 (4) *Restlessness*
 (5) Dysuria
 (6) *Effect of atropine*

(70) 50% of the renal colic cases are due to calculus, the remainder being due to infection a few being due to blood clot or mobile kidney

(71) *In kidney stones restrict the proteins but give milk and butter freely*

(72) In cases of bilateral kidney stones or all cases of metabolic stones where there is likelihood of affection of the other kidney be conservative as regards nephrectomy, especially if the patient is young

(73) New growths of the kidney of sufficient size to be detectable clinically are malignant

(74) *Age for renal malignancy*
 (a) *Infants under 4*
 (b) *Adults over 40*

(75) All growths of the renal pelvis must be regarded as malignant

(76) *The classical triad of renal tumours*
 (a) *Hæmaturia 63%*
 (b) *Renal tumour 53%*
 (c) *Pain 20%.*

(77) Retrograde pyelogram is very useful in the diagnosis of renal tumours

(78) Begg's sign in renal malignancy Med Ann. 1940 Engorgement of a vein from anterior superior iliac spine towards umbilicus or at the outer border of the rectus

(79) In one out of three cases of Grawitz tumour, growth extends into the main renal vein

(80) Before a patient is classified as suffering from hypertension of unknown origin, he should have a complete urological examination

(81) *Prostatic enlargement, chronic pyelonephritis, and renal calculus head the list of urological causes of hyper tension*

(82) *Renal malignancy*

(A) *Grawitz*

(*a*) *Hæmaturia*
(*b*) *Renal tumour*
(*c*) *Varicocele*
(*d*) *Age over 40*

(B) *Wilms*

(*a*) *Irregular large tumour*
(*b*) *Cachexia*
(*c*) *Age below 4*

(83) Hypernephroma constitutes over three fourths of malignant renal tumours, is seen in adults over 40, and is relatively most innocent of malignant renal tumours

(84) *Classical symptoms of renal malignancy*

(*a*) *Profuse, painless, periodic hæmaturia*
(*b*) *Renal tumour*
(*c*) *Age* (α) *Below 4*
(β) *Above 40*

(85) Painless hæmaturia or onset of varicocele after adult age, must be fully investigated as early as possible to exclude renal malignancy

(86) *Malignant kidney rivals syphilis as the greatest mimic in clinical medicine*

(*a*) Persistent unaccounted for pyrexia
(*b*) Metastases
(α) Bones
(β) Neck glands
(γ) Skin

(87) *Intravenous mercurochrome 10 c c s of 1% sol is an excellent antipyretic in protracted pyelonephritis*

(88) *In every operation for urinary stone, hang up the X Ray film near the operation table*

(89) Indications for urgent nephrectomy

(*a*) Rupture
(*b*) Uncontrolled hæmaturia.

(90) Nephrostomy tube
- (a) Local anæsthesia
- (b) Should not be tortuous
- (c) *Catgut anchor to kidney capsule*
- (d) Remove in 2–3 weeks
- (e) Keep urine acid

(91) *Lower part of kidney incision should not come within two inches of the iliac crest* so that there should be enough muscle left attached to it for easy suture at the time of closure

(92) Never attempt to haul the kidney out of the wound, deliver one pole at a time

(93) *Administration of fluids constitutes a most important part of the after treatment of all operations on the urinary system*

(94) *On no account should purgatives be given by mouth until a natural or enema action is obtained*

(95) Chief avenues of renal infection
- (a) Hæmatogenous septicæmia
- (b) Ascending lower genito urinary focus
- (c) Local calculus
- (d) Intestines B coli

(96) *Special renal examinations*
- (a) *Urine examination*
  - (α) Chemical
  - (β) Microscopical
  - (γ) Cultural
- (b) *Cystoscopy*
  - (α) Ordinary
  - (β) Ureteral catheterisation
  - (γ) Chromo cystoscopy
  - (δ) Instrumental pyelography
- (c) *X Rays*
  - (α) Simple plate
  - (β) Instrumental pyelography
  - (γ) Excretion urography
- (d) *Urea tests*
  - (α) Urine urea concentration
  - (β) Blood urea and N P N
- (e) *Circulatory system*
  - (α) Heart
  - (β) Arteries
  - (γ) B P

(97) *Differential diagnosis between kidney lesions and other intraperitoneal lesions is very important from the view point of approach*

Extraperitoneal	*Intraperitoneal*
Kidney and ureter	Appendix and cæcum
Spine	Liver and gall bladder
Ribs	Pylorus and duodenum
Pleura	Pancreas
Retrocæcal appendix	Ovaries
Ilium + sacro iliac joint	

(98) *Renal tumour*
- (a) *Movable or ectopic kidney*
- (b) *Hydro or pyo nephrosis*
- (c) *Polycystic kidney*
- (d) *Malignant kidney*
- (e) *Perinephric abscess*.

(99) Pressure signs in perinephric abscess vary with its position

(100) *Kidney syndrome*
- (a) *Costo vertebral pain and tenderness*
- (b) *Renal colic referred to*
  - (α) Thigh
  - (β) Inguinal region
  - (γ) Testis
- (c) *Bimanual palpation*
- (d) *Urine examination*

(101) *Pre operative treatment in renal operations*
- (a) *Urinary antiseptics and diuretics*
- (b) *Intestinal antiseptics and laxatives*
- (c) *Kidney function promoters*
- (d) *Anti acidosis treatment*
  - (α) Glucose
  - (β) Saline
  - (γ) Soda bi carb
- (e) *Heart and lungs vigil*

(102) Avoid instrumentation in acute infective and obstructive urinary cases, except for drainage.

(103) *Think of pyelitis and ureteral stone in every case of appendicitis*

(104) *Think of urinary sepsis in all pyrexias*

(105) *Urinary fistula is diagnosed by*
- (a) Smell
- (b) *Dye injection*
- (c) Chemical examination

(106) *Insidious cystitis in young robust person.*
? Tuberculous kidney

(107) In tuberculosis, examine the whole genito urinary system

(108) *Primary genito urinary tuberculosis*
- (a) *Kidney*
- (b) *Prostate and seminal vesicles*
- (c) *Testis*

(109) Density of shadow in X Ray film is in direct proportion to calcium content of the stone

(110) Bony metastases or varicocele may be the first sign of malignant kidney

(111) *Most common post operative complications after renal operations*
- (a) *Anuria → uræmia*
- (b) *Urinary sepsis*
- (c) Shock
- (d) Heart failure
- (e) Lung inflammations
- (f) Intestinal ileus

CHAPTER III

THE URETER

(I) CONGENITAL MALFORMATIONS:

(1) Duplication associated with double kidney
(2) Bifurcation associated with double pelvis
(3) Stricture
  (a) Upper end
  Treat (α) Ramstedt
    or (β) Transverse suture of vertical incision
    or (γ) Division of etiological band
    + (δ) Nephropexy
  (b) Pelvic brim
  (c) Lower end
  (d) Where it is crossed by uterine vessels in females
(4) Valves
(5) Misplacement } associated with ectopic kidney
(6) Diminished length } associated with ectopic kidney
(7) Undue mobility + kink associated with mobile kidney
(8) Pinhole ureteric orifice with ureterocele
  Treat by catheteral dilatation
  Complications are (a) Renal dilatation
    (b) Renal infection
(9) Ectopic ureteral orifice
  Sites (a) Prostatic urethra
    (b) Seminal vesicles
    (c) Vas deferens
    (d) Ejaculatory ducts
    (e) Vestibule
    (f) Urethra
    (g) Vagina
    (h) Uterus
  Clinic (1) Dribling urine
    (2) Urinary obstruction syndrome
    (3) Urinary infection syndrome
  Sign (1) Cystoscopy
    (2) Pyelography
  Compl (a) Urinary obstruction
    (b) Urinary infection

(II) URETERAL TRAUMA:

(1) ACCIDENTAL
  Etio (A) Subcutaneous
    (α) Fracture pelvis or vertebral process
    (β) Laceration of kidney
  (B) Penetrating
    Stab wounds

Clinic: (*a*) Shock
(*b*) Extravasation of urine in the loins
+ (*c*) Oliguria
Treat (1) Exploration
↓ (A) Ureteric catheter in situ for 3 days
+ Peri ureteral cellular drainage
or (B) Anastomosis over ureteral catheter
or (C) Ligature upper end
or (D) Nephrectomy with ligature lower end

(2) OPERATIVE:
Etio: (*a*) **Hysterectomy**
(*b*) Forceps delivery
Path: (*a*) **Section**
(*b*) **Ligature**
Compl: (1) **Urinary extravasation:**
(α) Peritoneal
(β) Extraperitoneal
(2) **Anuria with uræmia:**
: If injury to both ureters
(3) **Urinary fistulæ.**
: Internal or external
Sequelæ: (*a*) **Stricture ureter**
↓ (*b*) **Renal complications:**
(α) Atrophy
(β) Hydronephrosis
(γ) Infection
Treat: (A) **Prophylactic:**
: Preliminary ureteral catheters
(B) **Immediate during operation:**
(*a*) Partial injury
: Peri ureteral drainage
(*b*) Complete injury
(1) End to end anastomosis
or (2) Implantation of upper end.
(α) Bladder
(β) Sigmoid
(γ) Loin
or (3) Ligature + nephrectomy
+ (4) Peri ureteral drainage
(C) **Immediate post-operative:**
(*a*) Anuria after hysterectomy:
Path: Bilateral ligature
Treat: Bilateral nephrostomy
(*b*) Urinary fistulæ after pelvic oper.:
Treat: Exploration

(D) **Remote:**
- (*a*) Dilatation by ureteric catheters
- (*b*) Implantation of upper ureter
- (*c*) Anastomosis
- (*d*) Nephrectomy

Post treat Intermittent ureteral catheterisation

(III) URETERAL OBSTRUCTION:

Etio (A) UNILATERAL URETERAL OBSTRUCT

(1) **Wall:**
- (*a*) Valves, folds congenital
- (*b*) *Stricture* congenital
  acquired

(2) **Lumen:**
- (*a*) Impacted *calculus*
- (*b*) Blood clot, pus or debris

(3) **External pressure:**
- (*a*) Tumours
  Pregnant uterus
  Fibroids
  Ovarian cysts
- (*b*) Bands
- (*c*) Aberrant renal vessels
- (*d*) Abscesses psoas, perinephric

(4) **Implication in malignancy:**
- (*a*) Uterus
- (*b*) Rectum
- (*c*) Bladder

(5) **Kinking or torsion:**
Associated with mobile kidney

(6) **Trauma** Operative

(B) BILATERAL URETERAL OBSTRUCT

(1) **Lower urinary obstruction:**
- (*a*) Bladder
- (*b*) Urethra

(2) **Implication in pelvic malignancy**

(3) **Trauma in pelvic operations:**
- (*a*) Section
- (*b*) Ligature

Pathology: (1) Obstruction
↓ (2) Proximal dilatation
↓ (3) Proximal stagnation
+ (4) Proximal infection
or (5) Proximal atrophy

Clinical syndrome

(1) Acute and complete bilateral obstruction
: **Acute suppression of urine → uræmia**

(2) Acute and incomplete obstruction:
: **Acute renal colic**

(3) Chronic complete obstruction:
: Atrophy of the kidney
: **Chronic kidney failure → uræmia**

(4) Chronic incomplete obstruction:
: **Hydro-ureter and hydronephrosis**

(5) Acute or chronic recurrent obstruction:
: **Recurrent colic with hydronephrosis**

Compl.: (1) **Suppression of urine** → uræmia:
(*a*) Acute
(*b*) Chronic

(2) Proximal **dilatation with stagnation**

(3) Urinary **infection**

(4) Urinary **lithiasis**

Treatment. (A) Renal colic (See page 1642)
(B) Operative
(*a*) Drainage
(*b*) Removal of etiology

(IV) URETERAL STRICTURE:

Etio. (A) *Congenital*
(*a*) Pelvi ureteral junction
(*b*) Ureteric orifice
· Pin hole orifice with ureterocele

(B) *Acquired*
(*a*) **Traumatic**
(*b*) **Calculus** impaction
(c) Implication in a growth
(*d*) Secondary to genital sepsis

Clinic: **Back pressure:**
(*a*) Atrophy of the kidney
or (*b*) Hydronephrosis

Compl: **Infection:**
(*a*) Pyelitis
(*b*) Pyelonephritis
(*c*) Pyonephrosis

Treat. (A) **Pin-hole orifice:**
(*a*) Intermittent dilatation by a bougie
(*b*) Ureteric meatotomy: cystoscopic

(B) **Stricture ureter:**
(*a*) Bougie dilatation
(*b*) Plastic operation:
(1) Extraperitoneal exposure
↓ (2) Vertical slit
↓ (3) Passage of a catheter

↓ (4) Transverse suture
↓ (5) Tie in the catheter for 3 days

(C) **Pelvi ureteral stricture:**

(a) Removal of primary genital sepsis
+ (b) Intermittent bougie dilatation
or (c) Plastic operation

After treat Intermittent bougie dilatation

(V) URETEROCELE:

Def A cystic dilatation of the intramural part of the ureter
Due to prolapse of one or more of its coats

Etio Pin hole ureteric orifice

Types (1) Mucous prolapse of the muc. mem.
(2) Muscular

Clinic (1) Upper urinary obstruction
(a) Hydronephrosis
(b) Hydro ureter
(2) Cystoscopy
Cystic swelling round about the ureteric orifice which resembles a nipple of the breast

Compl (1) Infection
(2) Calculus

Treat Cystoscopic meatotomy

(VI) TUBERCULOUS URETER

Etio Secondary to tuberculous kidney

Clinic (1) Tender cord like ureter
(a) Abdominal palpation
(b) P R or P V
(2) Abnormal urine
Acid sterile pyuria
(3) Cystoscopy Golf hole orifice
(4) Intravenous pyelography
(a) Narrowing of lowest 1" of ureter
+ (b) Slight dilatation above
↓ (c) Thickening + dilatation + irregularity
+ (d) Tuberculous kidney

Treat Nephrectomy + excision of the ureter

(VII) *URETERAL CALCULUS:*

Etio Middle aged males on either side
Stones in renal pelvis

Path (a) *Types*
(1) Calcium oxalate aseptic urine
(2) Calcium phosph infected urine
(b) *Shape*
Ovoid elongated
(c) *Sites*
(a) Pelvi ureteral junction

(β) Ureteric orifice
(γ) Pelvic brim

Compl : (1) **Impaction :**
(a) **Calculous anuria**
(b) **Proximal obstruction :**
(α) Chronic suppression
(β) Hydronephrosis and hydro ureter

(2) **Infection :**
(α) Pyelitis
(β) Pyelonephritis
(γ) Pyonephrosis
(δ) Peri ureteritis

(3) **Urinary fistulæ**

(4) **Stricture**

Clinic (A) *Non impacted stone*
: **Renal colic** with varying levels
Pain referred to (α) Loin
(β) Inguinal canal
(γ) Penile root
(δ) Groin & testis

(B) *Impacted stone*
(a) **History of previous colics**
(b) **Constant pain :**
(α) Costo renal angle
(β) Tip of 9th rib
(γ) Outer border of rectus
(δ) Penile tip
(c) **Tenderness** ·
1" down and in to McBurney
(d) **Renal back pressure :**
(α) Pain
(β) Tenderness
(γ) Spasm
(e) : **Reflex signs :**
(α) Genital irritation
(β) Rectal irritation
(γ) Bladder irritation
(δ) Psoas irritation
(f) **Micturition :**
· Dysuria + strangury
(g) **Urine :**
(α) Hæmaturia
(β) Crystaluria
(γ) Pyuria

Signs: (1) **Palpation:** Tenderness, rigidity, stone
- (*a*) Abdominal
- (*b*) P. R.
- (*c*) P. V.

(2) **Cystoscopy:**
- (*a*) Ureteric orifice: inflamed
- (*b*) Efflux: abnormal
  - . Blood stained
  - . Cloudy
- (*c*) Ureteric catheterisation:
  - (α) Obstruction
  - (β) Grating
  - (γ) Relief of proximal tension
  - (δ) Ascending pyelogram

(3) **Radiography:**
- (*a*) *Plain*. shadow in the line of ureter
  - Diagnose from (α) Calcareous material
  - (β) Phlebolith
- (*b*) Opaque catheter bougie
- (*c*) Ascending pyelography
- (*d*) *Intravenous pyelography*

(4) **Kidney function tests**

Diff diag. (1) Pyelitis or pyelonephritis
(2) **Appendicitis**
(3) **Salpingitis**
(4) Cystitis
(5) Psoasitis or psoas irritation

Treat: *Factors in treatment:*

(A) **Size:**
- (*a*) Small passable expectant
- (*b*) Small impacted: cystoscopic
- (*c*) Large impacted · operative

(B) **Site:**
- (*a*) Lower part: cystoscopic removal
- (*b*) Upper part · cystoscopic trial
  - ↓ operative removal

(C) **Time:**
- (*a*) Recent: expectant
- (*b*) Upto 8 weeks. cystoscopic removal
- (*c*) After 8 weeks operative removal

(D) **Kidney condition:**
- (*a*) Good: expectant
- (*b*) Moderate: cystoscopic
- (*c*) Bad: operative

(E) **Skill of the surgeon**

(F) **Tolerance of the patient**

(i) *Expectant treatment:*

Ind: (*a*) Small passable stone:
: Not more than 10 m.m.
(*b*) Recent impaction
(*c*) Previous history of passing stone

Contra: (*a*) Back pressure
(*b*) Lower urinary obstruction
(*c*) Urinary infection
(*d*) Diseased kidney

Tech: (A) **By mouth:**
(*a*) Hydrotherapy
(*b*) Diuretics
(*c*) Urinary antiseptics
(*d*) Chemical opponents.
(α) Acids. acid ammon phosph.
(β) Alkalies soda-bi carb
(*e*) **Syntropan:**
: One tablet every 4 hours for 16 hours
(*f*) Glycerine
: 50 gs. T. D. S for 3 days

(B) **Subcutaneous:**
: Papaverine $\frac{1}{6}$ gr.

(C) **Rectal:** (For pain)

: ℞	Sodium bromide	drachm 1
	Chloral hydras	grs 30
	Tr. opium	m. 6
	Warm starch water	ounces 5

(D) X Rays:
: Series taken at intervals to mark the progress of the stone and evidence of back pressure on the kidneys

(ii) *Instrumental treatment:*

Ind: (*a*) Good kidney
(*b*) Lower third of ureter

Contra: (*a*) Bad kidney
(*b*) Severe reaction
(*c*) Stone > 2 cms.

Pre treat: Omnopon 2/3 gr. + scopolamine 1/150 gr.

Treat: (A) *Un impacted stone:*
: **Passage of an ureteric catheter**

(B) *Impacted stone:*
(1) *Impaction in upper part:*
(*a*) **By mouth:**
(α) Syntropan:
: One tablet every 4 hours
(β) Glycerine:
: 50 gs T. D. S. for 3 days

↓ (b) **Dilatation of ureter:**
- (α) Ureteral catheters & bougies
- (β) Buerger's dilating olives
- (γ) Ureteric dilators
- (δ) Jolly's hydrostatic dilators

↓ (c) **Injection of drugs in ureter:**
- (α) Passage of ureteric catheter
- ↓ (β) Ureteral injections of
  - (1) Lubricants
    - : **Olive oil: 5 c cs.**
  - (2) Anæsthetics + antispasmodics:
    - (α) Papaverine 5% In 5 c.cs olive oil
    - (β) 2% cocain + soda bi carb In distilled water
    - (γ) **2% novocain**
  - (3) Antiseptics + dislodgers
    - (α) Acriflavine 1 in 2000
    - (β) Hg oxycyanide 1 in 4000
    - (γ) **Silver nitrate: 1 in 4000**

(2) *Impaction in lower part*
- (a) **Cystoscopic scissors**
- (b) **Diathermy:**
  - (α) Coagulating
  - (β) Cutting
- (c) **Dilatation + injection** (See above)

(iii) *Operative treatment*

Ind
- (1) Calculus anuria
- (2) Renal dilatation
- (3) Renal infection
- (4) Failure of conservatism
- (5) Conservatism contraindicated

Tech: (A) *Kidney recoverable*
- : **Uretero-lithotomy:**
  - (a) Higher
  - (b) Vaginal
    - Ind Obese female patient

(B) *Kidney non recoverable*
- : **Nephrectomy + (or →) uretero-lithotomy**

(VIII) TUMOURS OF THE URETER:

(A) *Primary* very rare
- (1) Papillomata

Etio Secondary to pelvic papillomata

Compl
- (a) Spread downwards
- (b) Ureteral colic and obstruction
- (c) Urinary hæmorrhage
- (d) Carcinomatous metaplasia

(2) Carcinomata:
Etio: Papillomata
(B) *Secondary:*
Etio. Carcinoma of. (a) Uterus
(b) Bladder
(c) Rectum
(d) Colon
(e) Prostate
Compl (a) Urinary obstruction
(b) Urinary infection
(c) Urinary fistulæ
Treat. Removal of primary growth
With: (a) Kidney
(b) Ureter
(c) Ureteric orifice

(IX) OPERATIONS ON URETER:

(1) EXTRAPERITONEAL EXPLORATION:

(A) *Abdominal segment.*
(a) **Lumbar kidney incision**
(b) **Rectus incision:**
(α) Incision internal to linea semilunaris
(β) Rectus sheath and muscle split
(γ) Incision of transversalis fascia
(δ) Separation of peritoneum
(B) *Brim and pelvic segment*
(a) **Median subumbilical incision:**
: Steps as in rectus incision
(b) **Iliac incision:**
: Ant. sup iliac spine to mid Poupart
(c) **Trans-vesical route:**
Tech. (α) Suprapubic cystotomy
or (β) Cystoscopy
Ind: Calculus in the lowest part
Post oper: **Drainage of peri-ureteral cellular tissues**
Difficulties: (a) Adhesions
(b) Abnormal size
(c) Hæmorrhage

(2) URETERO-LITHOTOMY.

(a) Ureteral exposure
(b) Ureteral isolation
(c) Ureteral incision:
: In healthy proximal part
(d) Calculus displacement and extraction
(e) Passage down of an ureteral bougie
(f) Ureteral suture: not necessary
(g) Peri ureteral drainage

(3) URETERECTOMY

Ind (1) T B kidney and ureter
(2) Advanced hydro or pyo ureter
(3) Growths papillary pelvic tumours
(4) Hydro nephro ureter

Time (a) Primary in association with nephrectomy
(b) Secondary 6 months after nephrectomy

Tech (a) Exposure isolation and withdrawal of kidney
From lumbar incision
(b) Exposure and isolation of lower ureter
Through median or iliac incision
(c) Ligature division and carbolisation
Of lower ureteral end near the bladder
(d) Withdrawal out of lumbar wound
Of kidney and separated ureter
(e) Drainage tubes
(α) Lumbar
(β) Perivesical

(4) URETERO URETERAL ANASTOMOSIS

Ind (a) Traumatic division
(b) Traumatic rupture
(c) Stricture
(d) Growth

Tech End to-end oblique
(a) Extraperitoneal exposure
(α) Iliac
or (β) Midline
(b) Excision of affected part
(c) Oblique cut of both ends
(d) Ureteric catheterisation
(e) Interrupted submucous sutures
(f) Drainage

Post treat (1) Removal of ureteric catheter
On fourth day
(2) Intermittent ureteral dilatation
By bougies or catheters
(3) Pyelogram checks

Post-compl Stricture
Urinary fistula

(5) TRANSPLANTATION OF URETER

Ind (A) Bladder
(a) Congenital malformations
Ectopia vesicæ
(b) Malignant growths
(B) Ureter
(a) Congenital conditions
(b) Trauma lower pelvic part
(c) Stricture
(d) New growths

Tech *Transplantation into*
(A) *Bladder*
Ind (*a*) Post-operative ureteral fistula in pelvis
(*b*) During partial cystectomy
Tech (*a*) Lavage and distension of bladder
(*b*) Median suprapubic incision
(*c*) Extraperitoneal exposure
Of bladder and pelvic ureter
(*d*) Division and isolation of ureter
Above the obstruction
(*e*) 1/2" split of upper open end of ureter
(*f*) Anchor suture through each edge
↓ (1) Closed method
(*a*) Puncture of bladder
At the site of transplant
(*b*) Carrying anchor stitches
In and out of bladder
(*c*) Peri vesical drainage
For seven days
(*d*) Urethral drainage
For ten days
or (2) Open method
(*a*) Suprapubic cystotomy
(*b*) Puncture from inside out
(*c*) Steps as in (1)
(*d*) Suprapubic cystostomy
For ten days
(*e*) Perivesical drain
For seven days
(B) *Intestine*
Ind (*a*) Ectopia vesicæ
(*b*) Cystectomy
(*c*) Vesico vaginal fistula
(*d*) Exclusion of bladder
T B or growth
Tech (1) Stiles
Ureter infolded in wall by sutures
(2) Coffey
Ureter submucous before opening into the lumen
(3) Maydl
Implantation of ureter with trigone into sigmoid
(4) Winsbury White
Syn Two-stage submucous
Tech (A) First stage
(1) Subumbilical median laparotomy
(2) Peritoneal incision
(3) Ureteral isolation
(4) Peritoneal suture

(5) Incision into peritoneo-muscular coat of pelvic colon
(6) Submucous fixation of ureter
(7) Closure

↓ (B) Interval 2-3 weeks

↓ (C) Second stage
(1) Laparotomy
(2) Division of ureter
Below its intramural position
(3) Ligature of distal end
(4) Transfixation of proximal end
(5) Opening the colon
Just below the uretero bowel junction
(6) Fixation of open ureteral end
Within the bowel lumen
(7) Double closure of bowel opening
(8) Pericellular drainage
(9) Closure

(Same technique on other side)

Site For implantation
(*a*) 3" from recto vesical pouch
(*b*) Sigmoid flexure

(C) *Skin*

Syn Cutaneous ureterostomy

Ind (*a*) Intractable tuberculous cystitis
With pain + frequency
(*b*) Preliminary to total cystectomy

Tech (*a*) Incision of grid iron appendicectomy
(*b*) Division of int. oblique
(*c*) Division of ureter
Low down
(*d*) Ligature of distal end
(*e*) Isolation of the whole upper segment
(*f*) Ureteral catheterisation
(*g*) Ureter brought out of incision
For four cms
(*h*) Closure of the wound around ureter
(No anchoring of ureter)

Post-compl Sloughing of distal part of ureter

(D) *Vagina*

Post treat (1) Intravenous soda sulph
(2) Rectal tube to drain urine
(3) Urinary antiseptics
(4) Intestinal antiseptics

Post-compl. (1) Peritonitis
(2) Urinary obstruction
(3) Ascending urinary infection
(4) Incontinence
(5) Irritation of the reservoir
(6) Fæcal and urinary fistulæ

(X) IMPORTANT POINTS

(1) *The ureteric line crosses the tips of lumbar transverse processes*

(2) Ureteric stone should be diagnosed from
- (a) Renal affections
- (b) Appendicular affections
- (c) Colon affections
- (d) Bladder affections
- (e) Genital affections
- (f) Psoas affections

(3) *Beware of ureters in gynæcologic operations*
- (a) *Hysterectomy*
- (b) *Broad ligament cyst*

(4) *Most common causes of ureteric obstruction*
- (a) *Pregnant uterus*
- (b) *Trauma post operative*

(5) Extra urinary shadows confused with ureteral or renal stones
- (a) Calcified lymph glands
- (b) Phlebolith
- (c) Opaque intestinal contents
- (d) Gall stones

(6) In cases of doubt about ureteric shadow, pass an opaque ureteric catheter and take a film

(7) Types of urinary obstruction

(a) Acute and complete
Cause Impacted stone
Clinic Anuria
Compl Uræmia

(b) Chronic and incomplete
Cause Stricture
Clinic Hydronephrosis + hydro ureter
Compl (a) Uræmia
(b) Urinary infection

(8) *Best way of avoiding operative trauma to the ureters, is to pass ureteric bougies as a preliminary pre operative measure*

(9) *A divided ureter pouts, a divided artery retracts*

(10) No case of pyelitis should be considered to be satisfactorily explained until some cause of urinary obstruction within urethra bladder, ureter or renal pelvis has been demonstrated

(11) About 70 % of ureteric calculi pass naturally

(12) *On no account should an ureteric catheter be passed with its stilette in situ*

(13) Majority of ureteral stones are formed in the renal pelvis and become impacted in the ureter on their way to the bladder

(14) In ureteral colic, the site of maximum pain denotes the site of recent impaction

(15) *Most important symptoms of back pressure are persistent renal aching and tenderness which if present, should be regarded as an indication for early operation*

(16) *In cases of urinary stones do not overlook the etiological factor*

(a) *Obstruction*
(b) *Infection*
(c) *Metabolism*

(17) *A rapidly increasing pulse or pulse rate over 100 is suggestive of intraperitoneal lesion*

(18) *Examine the urine fully in every case of intra abdominal lesion, acute or chronic especially in suspected appendicitis*

(19) Two months is the maximum period for which a stone may be allowed to remain impacted, provided there are no appreciable complications

(20) Hæmaturia is not an uncommon complication of acute retro cæcal appendicitis

(21) It is unnecessary to suture the ureter after uretero lithotomy

(22) For exposure of the lower part of the ureter, median subumbilical incision is better than iliac incision

(23) When the ureter is suddenly and completely occluded, renal function on that side ceases forthwith eventually the kidney atrophies

(24) *Comparative calm of the patient with appendicitis is in sharp contrast with restlessness of the one in the agonies of renal colic*

(25) *Nephrostomy is the best immediate treatment of post operative recognisance of ureteral trauma* It is best to wait for several months before attempting to repair the ureter (Med Ann 1940)

(26) Absence of tension is of primary importance in ureteral anastomosis operations

(27) Indications for complete nephro ureterectomy

(a) Renal pelvis papillomata
(b) Tuberculous kidney

(28) *It is preferable to remove the appendix of a patient with a stone in the ureter than to neglect to do so in one with acute appendicitis*

(29) *Increased leucocytosis is in favour of appendicitis*

(30) 70% of impacted ureteral calculi are in the pelvic portion, 1"–2" above the bladder

(31) Ureteric calculi are more destructive to the kidney than renal pelvis stones

(32) Principles to be guarded in uretero intestinal anastomosis
  (a) Prevention of ascending infection
  (b) Safeguarding the vitality of intra mural ureter
  (c) Avoidance of kink or torsion

(33) *In ureteral transplantation, ascending infection to the kidney invariably occurs not by the ureteral lumen, but in some deeper plane*

(34) *Ureteral stone syndrome*
  (a) *Entirely epigastric pain*
  Always take a plain X Ray before a barium meal
  (b) *Pseudo appendicitis*
  (c) *Painful nocturnal emissions with hæmo spermia*
  (d) *Classical renal colic*

CHAPTER IV

THE BLADDER

(I) CONGENITAL MALFORMATIONS:

(1) EXTROVERSION EXSTROPHY

Syn Ectopia vesicæ

Def · Absence of anterior wall of the bladder together with lower (infra umbilical) anterior abdominal wall

Cause (a) Failure of forward growth of anterior cloacal membrane
or (b) Intra-uterine rupture of the bladder

Clinic. (1) Dark red supra pubic swelling
Exposed mucous membrane
(2) Constant leakage of urine
Through exposed ureteric openings
(3) Association with
(a) Epispadias
(b) Non-united symphysis pubis
(c) Other congenital defects

Compl (1) Urine dermatitis
(2) Ascending infection

Treat · (A) Plastic operations
(1) Wood
Abdominal flap method
(2) Trendelenburg
Division of sacro-iliac joints
↓ Approximation of symphysis
or (B) Transplantation of ureters Into
(1) Urethra Sonnenburg
(2) Intestines
Coffey Into the rectum
(α) Stile s modification
(β) Grey Turner s modification
(γ) Winsbury White's modification
(3) Vagina
(4) Skin cutaneous ureterostomy
or (C) Transplantation of the bladder
(1) Frank anastomosis of bladder & rectum
(2) Maydl trigone into pelvic colon
(3) Moynihan whole bladder into rectum
or (D) Bilateral nephrostomy
+ Excision of the bladder
+ Closure of the gap
↓ Permanent urinals

Time to operate. 7 10 years

Post. compl (a) Peritonitis
(b) Fæcal or urinary fistula

(c) Proctitis
(d) Ascending urinary infection
(e) Sloughing of the ureter

(2) VESICAL SPHINCTER STENOSIS
Syn Congenital bladder neck obstruction
Etio (1) Neuro muscular inco ordination
(2) Mechanical bars, folds, valves
Clinic (1) Difficult micturition
From birth
+ (2) No obstruction to catheter
Compl (a) Obstruction (α) Proximal dilatation
(β) Uræmia
(b) Ascending infection
Treat Retrograde catheterisation

(3) URACHAL MALFORMATIONS
(A) Developmental
Non-descent and retarded closure of the bladder
(B) Cysts
(C) Diverticulum at the lower end
(D) Tumours (a) Adenomata
(b) Carcinomata
(E) Fistula Patent urachus
Etio Old age enlarged prostate
Cause Urethral obstruction prostate or stricture
Clinic Umbilical urinary fistula
Treat (a) Removal of the cause
+ (b) Excision of the patent urachus

(4) CONGENITAL VESICAL DIVERTICULA

(5) CONGENITAL VESICO INTESTINAL FISTULA
Imperforate anus with rectum opening into bladder

(II) TRAUMA:

(1) RUPTURE OF THE BLADDER
Etio (a) **External violence:** Kick or blow
(α) Distended bladder
(β) Unguarded abdominal wall
(b) **Internal violence:**
(α) Catheterisation
(β) Litholapaxy
(c) **Fracture pelvis**
(d) **Operative trauma:**
(α) Blind supra pubic drainage
(β) Herniotomy
(e) **Spontaneous rupture:**
: Dfficult labour
Predisp (1) Intoxicated subject
(2) Distended bladder

Path (A) **Extraperitoneal**: 20%
Deep pelvic extravasation of urine
↓ Pelvic cellulitis

(B) **Intraperitoneal**: 80%
Pelvic peritoneal extravasation
↓ Pelvic peritonitis

(C) **Intra + extra-peritoneal**

Clinic (1) History of trauma
(2) Shock
(3) Strangury
(4) Empty bladder
(5) **Catheterisation test**:
Signs (a) Easy catheterisation
(b) Draws little and blood stained urine
Tech (a) Pass catheter
(b) *Fowler's position*
(c) Introduce 12 oz of sterile saline
(d) Withdraw
Result If less than introduced quantity
Rupture bladder
(6) **Excretory urography**

Late signs (A) **Intraperitoneal extravasation**:
Pelvic peritonitis
(B) **Extraperitoneal extravasation**:
Suprapubic boggy swelling
(a) Deep to the symphysis
↓ (b) Deep to abdominal muscles

Compl (1) Intraperitoneal extravasation
Local **Pelvic peritonitis**
General Toxæmia
(2) Extraperitoneal extravasation.
Local **Suprapubic cellulitis**
↓ Abdominal wall gangrene
↓ Urinary fistulæ
General Septicæmia
(3) General complications
(a) **Septicæmia**
(b) **Uræmia**

Diff diag. (A) **Catheterisation difficult**: *Rupture urethra*
(1) Rupture anterior urethra.
(a) *Distended bladder*
(b) Superficial extravasation
(2) Rupture posterior urethra:
(a) Distended bladder
(b) Deep extravasation

(B) **Catheterisation easy :** ***Rupture bladder***

(1) Extraperitoneal rupture bladder :
(a) Empty bladder
(b) Deep extravasation
(2) Intraperitoneal rupture bladder :
(a) Empty bladder
(b) Free fluid in peritoneum

(A) **Distended bladder :** ***Rupture urethra***

(1) Rupture anterior urethra
(a) Catheterisation difficult
(b) Superficial extravasation
(2) Rupture posterior urethra .
(a) Catheterisation difficult
(b) Deep extravasation

(B) **Empty bladder :** ***Rupture bladder***

(1) Extraperitoneal rupture bladder ·
(a) Catheterisation easy
(b) Deep extravasation
(2) Intraperitoneal rupture bladder
(a) Catheterisation easy
(b) Pelvic peritonitis

(A) **Superficial extravasation :** Ante symphy.

: Rupture anterior urethra
(a) Distended bladder
(b) Difficult catheterisation

(B) **Deep extravasation :** Retro symphysis

(1) Rupture posterior urethra .
(a) Distended bladder
(b) Difficult catheterisation
(2) Extraperitoneal rupture bladder :
(a) Empty bladder
(b) Easy catheterisation

(C) **Peritoneal extravasation :**

: Intraperitoneal rupture bladder :
(a) Empty bladder
(b) Easy catheterisation

Treat : **Catheterise every suspected case in operation theatre, prepared for cystostomy**

(A) ***Intraperitoneal rupture :***

Tech · (a) Sub umbilical paramedian incision
(b) Peritoneal incision and toilet
(c) Low Fowler's position
(d) Exposure of Retzius
(e) Suprapubic cystotomy
(f) Interrupted suture of rupture

(g) **Suprapubic bladder drain:**
3/4" bore tube
(h) **Peritoneal toilet** and closure
(α) Without drain
(β) With drain
(i) **Retzius drain**

(B) **Extraperitoneal rupture:**
Tech (a) Suprapubic cystostomy
(b) Retzius drain
(c) Indwelling urethral catheter

(C) **Operative bladder trauma:**
Tech (a) Two layers suture
(b) Self retaining catheter 10 days

Post. oper (1) Diuretics and urinary antiseptics
(2) Removal of drains
(a) Retzius 3 days
(b) Peritoneal 3 days
(c) Bladder 7-10 days
(d) Urethral 10 days

(2) WOUNDS OF THE BLADDER

Etio (a) Accidental
(b) Operative
(α) **Blind suprapubic drainage**
(β) **Herniotomy**

Predisp (1) Distended bladder in suprapubic drain
(2) Empty unrecognised bladder
In herniotomies

Clinic Escape of urine from the wound
Treat (a) *Closure two layers suture*
(b) *Urethral self retaining drain 10 days*
(c) *Incision drain 3 days*

(3) FOREIGN BODIES IN BLADDER

Etio (a) Females sexual aberration
(b) Males (α) Broken catheters
(β) Sexual aberration

Clinic (a) History
(b) Cystitis or calculus syndrome

Compl (1) Cystitis
(2) Calculus
(3) Perforation bladder

Diag Cystoscopy

Treat (A) Removal
(a) Urethral cystoscopic
(b) Suprapubic
↓ (B) Drainage bladder
(a) Urethral indwelling catheter
(b) Suprapubic

(III) INFLAMMATION:

(1) NON SPECIFIC CYSTITIS

Def Inflammation of the urinary bladder·
- (a) Non bacterial irritative
- (b) Bacterial infective

Sources
- (1) **Kidney:** Descending
- (2) **Urethra:** Ascending
- (3) **Local:** Calculus or growth
- (4) **Regional:**
  - (a) Lymphatic
    - (α) *Genital focus*
    - (β) *Intestines*
  - (b) Direct
    - (α) Through internal fistulæ
    - (β) Through external fistulæ
- (5) Hæmatogenous
  Distant focus
- (A) **Urinary sources:**
  - (a) Kidney
  - (b) Urethra
  - (c) Local
- (B) **Extra-urinary sources:**
  - (a) Genital focus
  - (b) Intestines

Routes
- (1) **Lumen:**
  - (a) Descending kidney → ureter →
  - (b) Ascending urethra →
- (2) **Lymphatic:**
  - (a) Cervix erosion
  - (b) Intestines B coli
- (3) **Blood:** Hæmatogenous
- (4) **Fistulæ:**
  - (a) External suprapubic
  - (b) Internal vesico intestinal

Predisp
- (1) **Obstruction** → stagnation
  - (a) Mechanical
  - (b) Paralytic
- (2) **Irritation**· Calculus
- (3) **Chemical reaction:**
  - (a) Acid B coli, T B
  - (b) Alkaline pyococci
- (4) **Reflex congestion:**
  - (a) Prostatitis
  - (b) Proctitis
  - (c) Appendicitis

(5) **Trauma** Retained hæmorrhage or F B
(6) **New growths**

Bacterio (A) **Acid urine**
- (a) B coli
- (b) T B

(B) **Neutral urine**
- (a) Gonococcus
- (b) B coli
- (c) Streptococcus

(C) **Alkaline urine**
- (a) Staphylococcus
- (b) B proteus

Etio types (A) *Primary cystitis*
- (a) Obstruction → **stagnation**
- (b) **Irritation** → inflammation
- (c) **Infection**

(B) *Secondary cystitis*
- (a) Kidney **descending**
- (b) Urethra **ascending**
- (c) Genitals or intestines regional
  - (α) Cervix uterus
  - (β) Prostate
  - (γ) Rectum

Path types (1) **Catarrhal** Congestive
(2) Hæmorrhagic
(3) Bullous
(4) Cystic multiple small cysts
(5) **Follicular** Granular polypoid
(6) Croupous membranous
(7) **Ulcerative**
- (a) Diathermic
- (b) Pressure foreign bodies
- (c) Cystitic
- (d) Solitary trigonal
- (e) Specific tuberculous

(8) **Leukoplakic**
Precancerous metaplasia

(9) Localised interstitial
Hunner s ulcer
Solitary ulcer at the vertex in females

(10) **Alkaline encrusted**
White plaques
Alkaline urine
Females

(11) Cystitis emphysematosa
Multiple small gas containing cysts

Clinic: (1) Painful frequency: **dysuria**
(2) Changes in urine: **pyuria**, hæmaturia
(3) General toxæmia · not marked

Signs: *Routine examination not in acute stage*

(A) **Catheterisation + urine examination:**
- (*a*) Physical
- (*b*) Chemical
- (*c*) Microscopical
- (*d*) Bacteriological

(B) **Search for primary focus:**
- (*a*) **Meatus**: Balanitis, urethritis
- (*b*) **Prostate**: Enlargement, gonorrhœa
- (*c*) **Cervix** Erosion
- (*d*) Abdominal palpation **kidneys**
- (*e*) Eyes and reflexes Tabes
- (*f*) **Spine**: Paralysis

(C) **Cystoscopy:**
- (*a*) Vascular changes
  Hæmorrhagic cystitis
- (*b*) Mucous membrane changes
  - (α) Surface
    - (1) Desquamation
    - (2) Pseudo membrane
  - (β) Sub-epithelial
    - (1) Œdema
    - (2) Bullæ
    - (3) Cysts
  - (γ) Ulceration
  - (δ) Proliferation granulations
- (*c*) Inflammatory products
  - (1) Mucus
  - (2) Epithelium
  - (3) Blood
  - (4) Pus
  - (5) Membrane or slough
  - (6) Products of urinary decomposition.
    - (α) Deposits
    - (β) Stones
- (*d*) Changes in bladder musculature
  - (1) Distention
  - (2) Trabeculation
  - (3) False diverticula

(D) **Excretion urography**

Clinic. types (1) **Acute cystitis**
(2) Subacute cystitis
(3) **Chronic cystitis**
(4) Relapsing cystitis

(5) Recurrent cystitis
(6) Insidious cystitis: tuberculosis
(7) Secondary cystitis stricture urethra

Compl. (1) Acute retention of urine
(2) Ascending urinary infection
(3) Calculus formation

Diff diag (1) **Reflex vesical irritation:**
(a) Pyuria absent
(b) Cause elsewhere
(2) **Secondary cystitis:**
Cause elsewhere

Treat (A) *Acute cystitis*
(1) **Diuretics:** Internal flushing
(a) Plenty of fluids
(b) ℞ Pot bicarb grs xxx
Pot citras grs. xx
Pot acetas grs xx
Tr hyoscyamus m xx
Tr belladonnæ m v
Spt chloroformæ m x
Inf buchu ad ounce ½
Ounce half every 4 hours
(2) **Antispasmodics:**
(a) Morphia or **hyoscine**
(b) Hypogastric fomentations
(c) Hot enema + morphia suppository
(d) **Hot sitz bath**
(3) **Chemical treatment:**
(A) Acid urine
(a) Alkaline mixture (See above)
Every 4 hours
+ (b) Caprocol or hexylresorcinol
(B) Alkaline urine
(a) Acid mixture
℞ Acid soda phosph grs. xx
Acid phosph dil m viii
Acid nitrohydrochl dil m viii
Liq strychninæ m iii
Spt chloroformæ m x
Inf gent co ounce ½
Ounce half T. D S
+ (b) Hexamine grs x before meals
(4) **Urinary antiseptics:**
(See under Bacilluria)
(5) **Chemotherapy:** Sulphonamides

(ε) **Symptomatic**
(a) Dysuria hot hip baths
(b) Pain
Instil 4 ounces of liq paraffin

(B) *Subacute and chronic cystitis*
(1) *Medicinal*
(a) **Diuretics** (See above)
(b) **Chemical treatment** (See above)
↑↓ (a) Alkaline week
(b) Acid week
(c) **Urinary antiseptics**
(See under Bacilluria)

(2) *Local*
(a) **Instillations**
(α) Silver nitrate 2%
(β) Acetic acid in alkaline cystitis
(γ) Soda bi carb in acid cystitis
(b) **Bladder washes**
(1) Mercury oxycyanide 1 in 4000
(2) Pot permanganate 1 in 2000
(3) Mercurochrome 1 in 100
(4) Acriflavine 1 in 10000
(5) Boric acid half saturated
(c) **Cystoscopic applications**
(α) Leukoplakia
(β) Hunner s ulcer
Absolute alcohol injection around the periphery
(d) **Urinary drainage**
(α) Urethral drain
(β) Suprapubic cystostomy

(3) *Specific*
(a) Vaccines and sera
(b) Chemotherapy
(c) **Mandelic acid regime**

(2) TUBERCULOUS CYSTITIS

Etio (1) T B kidney
(2) T B prostate or seminal vesicles

Morb anat Tubercles ulcers granulations fibrosis

Clinic **Spontaneous and insidious gradually progressive and persistent cystitis in young adults**

Signs (1) Cystoscopy
(A) **Golf-hole ureter**
(a) Œdema of orifice

↓ (*b*) Small tubercles around orifice
↓ (*c*) Gaping orifice
↓ (*d*) Retracted orifice

(B) Bladder
Thickened contracted

(2) **T B elsewhere** in genito urinary system
(*a*) Kidney
(*b*) Prostate

(3) **T B bacilluria**

Compl (*a*) Renal failure
(*b*) Urinary sepsis
(*c*) Extension to other organs

Treat (1) **Removal of etiology**

(2) **General anti tuberculous** treatment

(3) **Local** treatment
(*a*) Lavage (contraindicated)
(*b*) Instillations
(*c*) Applications

(4) **Symptomatic** treatment
(*a*) Alkalies
(*b*) Antispasmodics
(*c*) Sandalwood oil

(5) **Palliative** treatment
(*a*) Ureteral diversion
Ind Intolerable pain
Tech Cutaneous ureterostomy
(*b*) Pre sacral neurectomy

(6) Additional measures (Med Ann 1935)
(A) Rovsing's treatment
Irrigations of 6% warm carbolic acid
(B) Hollander's treatment
(*a*) Pot. iodide internally
↓ (*b*) Calomel emulsion instillations
= (*c*) Mercury iodide formation
(C) Witzack's treatment
Instillations of 20% lactic acid
(D) Greenberg's treatment
(*a*) Methylene blue pills
2 grs T D S for three weeks
\+ (*b*) Methylene blue instillations
10% twice a week
\+ (*c*) Warm liquid paraffin instillations
4 ounces once a week
\+ (*d*) Soda bi-carb irrigations
2%
\+ (*e*) Alkalies by mouth

(3) TYPHOID CYSTITIS

Etio Convalescence from typhoid

Clinic. (a) Cystitis
(b) **Typhoid bacilluria**: Typhoid carriers
(c) History

Treat (1) As for cystitis
(2) Anti typhoid measures

(IV) TUMOURS:

(1) PAPILLOMA BLADDER

Etio (a) **Secondary**: To renal pelvis
(b) Bilharzial
(c) Aniline dye workers
(d) Leukoplakic

Incidence. Young adult males

Path types (1) Papillary
(2) Papillary → infiltrating
(3) Infiltrating

Special (a) **Spread by implantation**
(b) **Infiltration**: Malignancy
(c) **Recurrence**

Clinic **Profuse, painless, intermittent, abrupt, bright-red hæmaturia**

Signs (1) **Hæmaturia** or growthuria
(2) **Cystoscopy**:
Pedunculated, villous, single or multiple
Site Above and external to ureteral openings

Compl (1) **Hæmaturia**:
Treat Silver nitrate instillations
(2) **Retention of urine**:
Treat Bladder lavage
(3) **Infection**:
(a) Local
(b) Ascending
(4) **Calculus**
(5) **Malignancy**

Treat (A) *Conservative*
Daily instillations of silver nitrate
2 ounces of 1 in 3500 sol
(B) *Operative*
(1) Urethral **cystoscopic removal**
(2) **Electro coagulation**:
Ind: Accessible and recurrent
Tech Sittings at fortnightly intervals
↓ Follow up every 3 months for 3 years

(3) **Suprapubic cystostomy:**
- Tech Diathermy knife or fulguration
- Points (*a*) Protection of the wound
  - (*b*) Silver nitrate instillations

(C) *Special* in bilharzial papillomata
- Intravenous tartar emetic $\frac{1}{2}$ gr in 10 c.cs.

Post treat
- (1) **Silver nitrate instillations**
- (2) **Repeated inspections**

Post seq
- (1) Recurrence
- (2) Implantation
- (3) Malignancy

(2) CARCINOMA BLADDER

Etio Incidence Males between 40 and 50
- Predisp (*a*) **Papilloma**
  - (*b*) Leukoplakia

Path (A) *Primary*
- (1) **Malignant papilloma:**
  - Infiltrating papilloma
- (2) **Bun-shaped pedunculated**
- (3) **Infiltrating:**
  - Widely spreading scirrhous
- (4) **Carcinomatous ulcer:**
  - Raised, everted, indurated margins

(B) *Secondary* To
- (*a*) Cervix uteri
- (*b*) Prostate
- (*c*) Rectum
- (*d*) Intestines
- (*e*) Kidney

Histology
- (1) Squamous
- (2) Adeno-carcinomatous
- (3) Spheroidal

Course
- (1) Local growth
- ↓ (2) Surrounding infiltration
- ↓ (3) Lymphatic permeation
- ↓ (4) Blood metastases rare

Compl
- (1) **Infection:**
  - (*a*) Vesical → ascending
  - (*b*) Perivesical
- (2) **Obstruction:**
  - (*a*) Proximal dilatation
  - (*b*) Suppression urine → uræmia
- (3) Urinary fistulæ
- (4) Hæmaturia
- (5) **Cachexia and exhaustion**

Clinic (A) **Hæmaturic:**
. Pronounced, painless or painful hæmaturia
or (B) **Cystitic:**
Septic cystitis
or (C) **Urinary obstruction**
↓ (D) **Late symptoms:**
(a) **Pain:** Dysuria, strangury
(b) Multiple urinary **fistulæ**
(c) **Emaciation:**
(α) Hæmorrhage
+ (β) Toxæmia
(1) Septic
(2) Uræmic
(3) Malignant

Signs (1) **Urine examination:**
Growthuria
(2) **Rectal examination:**
Growth of the bladder felt per rectum is never innocent
(3) **Cystoscopy:**
(a) Nature of the growth
(b) Extension of the growth
(c) Condition of the bladder

Treat (A) *Radical*
Contraind (a) Local growth beyond the bladder
(b) Urinary (α) Urinary sepsis
(β) Kidney failure
(c) General (α) Pulmonary diseases
(β) Circulatory diseases
(γ) Cachexia

Operations (1) **Cystoscopic diathermy fulguration**
Ind Early suspected cases
Contraind (a) Cloudy urine
(b) Hæmorrhage → clot retention
(c) Inaccessible situation
(2) **Resection with healthy margin**
Ind Early solitary growth
(3) **Partial cystectomy:**

(6) (a) **Preliminary ureteric transplant.:**
- (α) Into the colon
- (β) Into the skin

↓ (b) **Total cystectomy:**
- Ind (a) Multiple malignant papilloma
- (b) Trigonal growths
- (c) Intractable cystitis

(B) *Palliative*

(1) **Diathermy resection:**
- (a) Suprapubic with cystostomy
- (b) Urethral

(2) **Radiation:**
- (a) Radium
  - (α) Interstitial irradiation
  - (β) Radon seeds
  - (γ) Surface applications
- (b) Deep X Rays
- (c) Low voltage contact therapy
  After suprapubic cystostomy

(C) *Symptomatic*

(1) *Hæmaturia*
- (a) Silver nitrate lavages (1–10,000)
- (b) Adrenaline or silver nitrate instil
- (c) General treatment

(2) *Pain*
- (a) Conservative
  - (α) Morphia and suppositories
  - (β) Bladder lavages
    Hcl m xx in H_2O pint 1
  - (γ) Bladder instillations
    - (1) Aspirin
    - (2) Liquid paraffin
- (b) Conservo-operative
  Intraspinal alcohol injection
- (c) Operative
  - (α) Cotte
    Presacral neurectomy
  - (β) Fœrster
    Posterior rhizotomy
  - (γ) Spiller
    Lateral chordotomy

Routes for bladder growth treatment

(1) Per urethral
- Tech Cystoscopic excision diathermy or fulguration
- Ind Early suspicious growth

Contra: (a) Cloudy urine
(b) Hæmorrhage
(c) Clot retention
(d) Inaccessibility
(2) Suprapubic:
Ind: (a) Malignant growths
(b) Borderline growths
(c) Associated complications:
(α) Cystitis
(β) Stones
(γ) Enlarged prostate
(d) Irritable bladder
Tech. (a) Diathermy fulguration
(b) Diathermic excision
(c) Local resection
(d) Partial cystectomy
(e) Hemicystectomy
(f) Total cystectomy
Compl (a) Wound implantation
(b) Permanent suprapubic fistula
(3) SARCOMA BLADDER
Etio. Extremes of life
Path: (a) Submucous
(b) Perivesical
Clinic: (a) Pedunculated
(b) Sessile

(V) VESICAL CALCULUS: (See Urinary Lithiasis)

Etio: (1) **Metabolic errors:**
(a) Vitamine deficiency: (Vit. A)
(b) Calcium disturbances
(2) **Urinary errors:**
(a) Stagnation: leading to
(α) Precipitation
(β) Changed chemical reaction
+ (b) Infection: *leading to*
(α) Decomposition
(β) *Inflammation*
(c) Foreign bodies
Path: (1) **Uric acid or urates:**
: Shaligrams; moderate growth
(2) **Oxalates:**
: Mulberry mass; slow growth
(3) **Phosphates:**
: Chalky; *rapid growth*
(4) Cystin; xanthin; indigo
Path. types: (A) **Primary: Metabolic pathology**
Source: Kidney
Medium: Sterile urine

Comp: (*a*) Uric acid
(*b*) Calcium oxalate

(B) **Secondary: Local pathology**

Source: Bladder
Medium: Infected, stagnated urine:
(*a*) Stagnation
↓ (*b*) Decomposition
↓ (*c*) Infection
↓ (*d*) Changed reaction

Comp: Phosphatic encrustations over nucleus of:
(*a*) Kidney stone
(*b*) Foreign body

Sites: (1) **Bladder: Post-prostatic pouch**
(2) Prostatic urethra
(3) Diverticulum

Clinic: (1) **Dysuria and strangury:**
: Sharp, cutting pain at the base or end of the penis
(2) **Urine:**
(*a*) **Hæmaturia: slight, painful**
(*b*) Crystaluria
(*c*) Pyuria · if urinary infection
(3) **Symptoms of primary focus:** (Secondary stones)
(*a*) Enlarged prostate
(*b*) Stricture urethra
(*c*) Cystitis
(4) **In children:**
(*a*) Erection and masturbation
(*b*) **Crying micturition**
(*c*) Ammoniacal smell of left palm

Signs: (1) P. R or P. V.. Bimanual
(2) **Sounding** or metal catheterisation
(3) **Radiography:**
: Negative in uric acid & urates
(4) **Cystoscopy**

Diagnosis: Symptoms: (*a*) Aggravated by movements
(*b*) Relieved by rest

Compl: (1) **Acute urinary retention**
(2) **Back pressure**
(3) **Infection:** Local and ascending
(4) Growths

Treat: (A) ***Treatment of etiology:***
(*a*) Treatment of metabolic error
(*b*) Treatment of urinary error:
(α) Obstruction
(β) Infection

(B) *Treatment of calculus:*

(1) **Litholapaxy or lithotrity:**

Ind: (*a*) **Experienced surgeon**
(*b*) **Endemic regional cases**
(*c*) No urinary infection
(*d*) No urethral obstruction

Contra: (A) **Calculus:** *Unsuitable*
(*a*) Too large or small
(*b*) Too hard or soft
(*c*) Impacted in a diverticulum
(B) **Bladder:** *Infection*
(*a*) Cystitis
(*b*) Small irritable bladder
(*c*) Diverticulum bladder
(*d*) Growth of the bladder
(C) **Urethra:** *Obstruction*
(*a*) Small bore: children
(*b*) Stricture
(*c*) Enlarged prostate
(*d*) Acute urethritis
(D) **Kidney:** *Inefficiency*
(*a*) Infection
(*b*) Inefficiency
(E) **Inexperience of the surgeon**

Instrument: (1) Blind lithotrite
(2) Ryall's cystoscopic lithotrite
(3) Young's cystoscopic rongeur

Tech: (See under Operations)

Post. compl: (*a*) Perforation bladder
(*b*) Hæmorrhage
(*c*) Ascending urinary sepsis
(*d*) Anuria → uræmia

Advantage: (*a*) No cutting operation
(*b*) Short convalescence

Disadvantage: (*a*) Blind technique
(*b*) Recurrence

(2) **Suprapubic lithotomy:**

Ind: All cases where litholapaxy is not specially indicated

Tech: (See under Operations)

(VI) BLADDER FISTULAE:

(1) SUPRAPUBIC VESICAL FISTULA:

Etio: (1) **Congenital:** Patent urachus (See page 1685)

Site: Umbilicus
Clinic: Umbilical urinary fistula
Cause: Urethral obstruction
Treat: (*a*) Removal of the obstruction
+ (*b*) Excision of the urachus

(2) **Acquired:**
- (*a*) **Sepsis:** Extravasation of urine
- (*b*) **Malignancy**
- (*c*) **Post-operative:**
  - (α) **Distal urinary obstruction**
  - (β) **Sepsis** and irritation
  - (γ) Fibrosis and adhesions
  - (δ) Malignancy

Clinic Suprapubic opening discharging urine

Sign. Intravenous or intramuscular dye injection
↓ Colouring of the discharge

Compl (*a*) *Inconvenience*
(*b*) Skin irritation

Treat (1) **Emollients to the skin:**
Sterile vaseline or paraffin
(2) **Removal of etiology:**
Distal obstruction
(3) **Urethral drainage**
(4) Permanent urinal contrivance.
Cause irremovable

(2) VESICO INTESTINAL FISTULA.

Sites. (*a*) Rectum
(*b*) Sigmoid
(*c*) Cæcum
(*d*) Ileum

Etio. (A) **Congenital: Cloacal abnormality**
(B) **Trauma:** (*a*) **Parturition**
(*b*) Fracture pelvis
(*c*) Wounds
(C) **Inflammation:** (*a*) Appendicular abscess
(*b*) **Diverticulitis**
(*c*) **Regional enteritis**
(*d*) Tuberculosis
(D) **Neoplastic: Carcinoma sigmoid or rectum**

Symp: (1) Cystitis
(2) Pneumaturia or fæces uria
(3) **Urine per anum**

Signs: (*a*) Rectal examination
(*b*) **Barium enema or meal**
(*c*) Intravenous pyelography
(*d*) **Cystoscopy**
(*e*) Sigmoidoscopy

Compl: (1) **Ascending urinary infection**
(2) Intestinal obstruction
(3) Peritonitis or peritoneal abscess

Treat: (1) **Plastic operations:**
Ind: (*a*) No infection
(*b*) No malignancy
Tech: Combined: intraperitoneal + intravesical
(2) **Diversion operations:**
Ind: (*a*) Malignancy
(*b*) Sepsis
(*c*) Preliminary to plastic
Tech: (1) Short circuit
(2) Colostomy: proximal

(3) VESICO-VAGINAL FISTULA
Etio: (*a*) **Trauma:** (α) **Parturition**
(β) Operation
(*b*) Malignancy. carcinoma cervix
Clinic: (1) **Dribbling urine per vaginum**
(2) Cystitis
(3) Local examination: vaginal
(4) Cystoscopy: chromo cystoscopy
Compl: (*a*) Irritation of skin
(*b*) Inconvenience
(*c*) Ascending urinary infection
Treat: (A) **Preliminary:**
(*a*) Bladder lavage
(*b*) Vaginal douches
(*c*) Urinary antiseptics
↓ (B) **Suprapubic cystostomy**
↓ (C) **Plastic repair:**
Tech: (*a*) Excision of the fistula
(*b*) Separation of organs
(*c*) Separate closure
(*d*) Bladder drainage
Routes: (*a*) Vaginal
or/+ (*b*) Vesical
or (*c*) Peritoneal
Post. treat: (1) Continuous closed drainage
+ (2) **Prone position**

(4) VESICO-PERINEAL:
Etio: (*a*) Perineal lithotomy
(*b*) Malignancy
(*c*) Prostatic abscess: tuberculous

(VII) BLADDER TRABECULAE & DIVERTICULAE:

(1) TRABECULATION OF THE BLADDER:

Def Elevations of muc membrane caused by intravesical projections of the muscular bundles of the vesical wall.

Site Any part except
(a) Trigone
(b) Inter ureteric bar
Types (1) Hypertrophic trabeculation
Cause Lower urinary obstruction
Path Hypertrophied and contracted bladder
Clinic Frequent scanty micturition
Treat Removal of the obstruction
(2) Nervous disease trabeculation
Cause Tabes dorsalis or spinal lesions
Path Paralytic obstruction
Clinic Retention or incontinence
Treat Palliative
(3) Idiopathic Old age

(2) DIVERTICULUM OF THE BLADDER
Def A pouch communicating with the bladder
(a) Lined by mucous membrane
(b) Surrounded by fibrous tissues
(c) Protruding through muscular hiatus
(α) Congenital
or (β) Acquired
Types (A) False
Multiple shallow depressions between trabeculæ
(B) True
Etio (1) Congenital
(2) Acquired
(a) Tension
Intravesical tension due to distal obstruction
(b) Traction
Due to adhesions
Sites Weak spots of the bladder
(a) Around the intramural ureter
(b) Immediately above the trigone
(c) Region of the urachus
Clinic (1) Intractable recurrent cystitis
(2) Pronounced pyuria
(3) Two-stage micturition
(4) Bimanual palpation
(5) Two-stage catheterisation
(6) Cystoscopy
(7) Urography
(a) 15% sodium iodide or bromide
(b) Lateral plates
Compl (1) Back-pressure
Hydro ureter → hydro-nephrosis
(2) Ascending infection
Cystitis → pyelitis
(3) Calculus
(4) Malignancy
Treat (A) Pre-operative investigations About

(a) The local condition
(b) Complications present
(c) Renal function
(B) *Pre-operative preparations* ·
(a) Urinary antisepsis
(b) Renal efficiency
(C) Operations (See under Operations)
(1) Suprapubic excision ·
(a) Extravesical
(α) Intraperitoneal
(β) Extraperitoneal
(b) Intravesical
After cystotomy
or (1) Invagination Of the sac
or (1) Marsuplalisation Of the sac
+ (2) Cystostomy
+ (3) Extravesical drainage
If urinary sepsis or/+ renal failure.
Two-stage operation
(a) Drainage of bladder and diverticulum
↓ (b) Excision and repair
Post. treat (1) Diuretics and urinary antiseptics
(2) Bladder lavage
Post. compl (1) Ascending urinary infection
(2) Anuria → uraemia
(3) Intercurrent chest complications

(VIII) HERNIA OF THE BLADDER:

Etio: (a) Urinary obstruction
(b) Traction
Path: (a) Extra or pro-peritoneal gliding inguinal hernia
(b) Intra peritoneal
(c) Para peritoneal direct inguinal hernia
Assn. (1) Direct inguinal hernia
(2) Gliding inguinal hernia
Clinic: (1) **Hernia with urinary symptoms:**
(a) Frequent or difficult micturition
(b) Effect of micturition on the size
(c) Catheter guided into the sac
(2) **Hernia without urinary symptoms:**
(a) Operative trauma with leaking urine
(b) *Adherent pad of fat.*
. To the medial side of the neck of the sac
Compl: **Trauma** to the bladder.
Etio. In herniotomies
Treat: (a) Close the rent
(b) Drain the herniotomy wound · 3 days
(c) Urethral drain: 10 days

(IX) OPERATIONS ON THE BLADDER:

(A) *Pre operative measures*

- (1) **Renal function restoration:**
  - (*a*) Urinary drainage
  - (*b*) Diuretics and hydrotherapy
- (2) **Urinary antisepsis**
  - (*a*) Medicinal
  - (*b*) Local (α) Drainage
    - (β) Lavage
- (3) **General health**

(B) *Bladder instrumentations*

- (1) CATHETERISATION
  - Ind (*a*) **Relief of retention**
    - (*b*) Vesical **trauma**
    - (*c*) Vesical and supravesical **drainage**
    - (*d*) Vesical **lavage** or instillations
    - (*e*) Urethral trauma
    - (*f*) [illegible]
  - Contraind [illegible]
  - Catheters (*a*) Varieties (α) Rubber
    - (β) Gum elastic
    - (γ) Metal
  - (*b*) Shapes (1) Ordinary
    - (2) Prostatic
    - (3) Coude
    - (4) Bicoude
    - (5) Olivary
    - (6) Self retaining
  - (*c*) Sizes
    - (1) **Charriere or French:**
      - No 4 – 30
      - Denotes the external circumference in millimetres
    - (2) **Benique:**
      - Twice the Charriere
    - (3) **American:**
      - 2/3 rds the Charriere
    - (4) **English:** (has a catheter gauge)
      - 2 less than American
      - No 1/2 to 15 (No 8 E has diameter of 5 m m. & every size upwards or downwards varies by 0 5 m.m)
  - (*d*) Sterilisation ·
    - (1) Metal and rubber:
      - · Boiling

(2) Gum elastic.
- (α) Cover with cloth or lint
  - Immerse in boiling water for 2 minutes
  - Steep in sterile boric lotion
- (β) Formalin vapour sterilizer.
  - Rinse in normal saline

Lubricants
- (a) Sterile vaseline
- (b) Sterile liquid paraffin
- (c) **Sterile olive oil**
- (d) Hyd oxycyanide grs $3\frac{1}{2}$
  - Glycerine drachms $5\frac{1}{2}$
  - Tragacanth grs 46
  - Aqua distil sterile ad ounces 3
  - (Pye's surgical handicraft)

Tech
- (a) **Cleanse the glans and prepuce**
- (b) **Anterior urethral irrigation**
- (c) **Urethral anæsthesia**

Solutions
- (α) Novocain 4%
- (β) Percaine 1 in 1500
- (γ) Decicaine 2%
- (δ) Cocaine 5%
- (ε) Cocaine hydrochlor grs iii
  - Sodium bicarbonate grs iii
  - Chloretone gr. $1\frac{1}{2}$
  - Distilled water ounce $1\frac{1}{4}$

Tech
- (α) Inject 2 dms by urethral syringe
- (β) Apply penile clamp
- (γ) Repeat thrice (α) & (β):
  - At the interval of three minutes

(d) **Rigid antisepsis of:**
- (1) Hands
- (2) Catheters & lubricant
- (3) Meatus and glans
- (4) Surroundings sterile towels

(e) **Catheteric manœuvres:**
- (1) Rubber → gum elastic → metal
- (2) Go from biggest to smallest size:
  - Normal urethra is 20 F or **12 E.**
- (3) *Never force your way in*
- (4) Keep steady pressure
- (5) Keep to the roof of the urethra

Post treat (a) Tie in the catheter
- Ind (1) Gradual decompression of bladder
- (2) Continuous dilatation of

(*b*) *Gradual decompression in acute retent*
Rate *4 ounces each hour*
Methods (α) Intermittent evacuation
Every two hours
(β) Continuous decompression
Kidd s U tube
(*c*) Bladder lavage if required
(*d*) Diuretics and urinary antiseptics

Compl (1) **Urethral obstruction**
Treat (*a*) Conservative antispasmodics
(*b*) Meatotomy
(*c*) Urethrotomy
(*d*) Suprapubic puncture

(2) **Urethral shock**
Treat (*a*) Urethral anæsthesia
(*b*) Stimulants
(*c*) Avoidance of
(α) Rough handling
(β) Handling in 2nd stage of general anæsthesia

(3) **False passage**
Etio (A) Urethral obstruction
(*a*) *Stricture*
(*b*) *Enlarged prostate*
+ (B) Rough handling
Clinic (*a*) Urethral obstruction
+ (*b*) Forcing the way
↓ (*c*) Sudden advance
+ (*d*) Sharp pain
+ (*e*) Escape of blood
+ (*f*) *Impaction of catheter*
+ (*g*) Absence of urine
Treat (1) Delicate handling
(2) Keep to the roof
(3) *Avoid small metal catheters*

(4) **Absence of urinary flow**
Causes (1) False passage impacted catheter
(2) Blocked catheter (*a*) Stilette
(*b*) Irrigate
(3) Anuria catheter in + no urine
(4) Previous recent urine evacuation
Always inquire beforehand
(5) Rupture bladder

(5) **Hæmorrhage**
Causes (*a*) False passage
(*b*) Malignancy

(6) Rupture bladder:

Cause: (*a*) Rough handling
+ (*b*) Small bladder
+ (*c*) Small metal catheter

Clinic. (*a*) Difficult catheterisation
+ (*b*) Rough handling
+ (*c*) Pain + shock
+ (*d*) Urine flow absent or meagre

Treat Immediate suprapubic exploration

(7) Breaking of catheter:

Treat Removal (*a*) Urethral
(*b*) Suprapubic

(8) Urethral fever

Path Urethral toxæmia
Clinic Rise in temperature
Treat (*a*) Previous dose of quinine grs. x.
(*b*) Urinary antiseptics pre & post

(9) Infection:

Etio (*a*) Want of care in asepsis
(*b*) Repeated catheterisation
(*c*) Continuous indwelling catheter
(*d*) Paralysed bladder

Clinic (1) Urethritis
↓ (*a*) Peri urethral abscess
↓ (*b*) Urethral fistula
↓ (2) Cystitis
↓ (3) Pyelitis

Treat (*a*) Diuretics and antiseptics
(*b*) Closed aseptic drainage
(*c*) Bladder lavage
(*d*) Avoidance of catheterisation:
As far as possible
(α) In acute stage
(β) In paralysis
(γ) Frequent or repeated
(δ) Continuous

(10) Anuria:

Cause (*a*) Instrument. in acute conditions
(*b*) Sudden complete relief of acute retention

Treat (1) Gradual bladder decompression
4 ounces per hour
(2) Hydrotherapy and diuretics

(11) Hæmaturia

Cause (*a*) Sudden complete relief of acute retention
(*b*) Bladder growths

Treat: (a) Gradual bladder decompression
(b) Hot bladder lavage
(c) Astringent instillations:
(α) Silver nitrate
(β) Adrenaline
(d) General treatment of hæmorrhage

(12) Urethral fistula or stricture:

Cause. Indwelling metal catheter
Path: (a) Urethral irritation
↓ (b) Urethral ulceration
↓ (c) Urethral perforation: fistula
or (c) Urethral fibrosis. stricture
Site *Peno scrotal junction*
Treat Avoid indwelling metal catheter:
. Especially in children

(2) SOUNDING

Def. Passage of solid graduated metal bougies for:
(a) Diagnosis.
(α) Urethral conditions
Stricture, stone
(β) **Bladder conditions:**
Stone
(b) Treatment·
Urethral conditions (stricture)
(c) Guide·
To bladder in operations

Preparation. **Distension of the bladder.** By
(a) Retention of urine
or (b) Instillation of half a pint boric lotion

Tech: As in catheterisation
Compl: „ „ „

(3) CYSTOSCOPY

Ind. (a) Examination of bladder, ureter & pelvis
or (b) Treatment of bladder conditions
\+ (c) No urethral obstruction

Tech. (1) Urethral lavage and anæsthesia
(2) Bladder lavage and distension:
: By clear colourless fluid
(3) Lubricant. glycerine
(4) *Test the light: before passing*
(5) Introduction of the cystoscope
(6) Lavage and distension with clear fluid
(7) Examination or treatment:

Normal: (a) Air bubble: fundus
(b) 4 o'clock: left ureteric orifice
(c) 8 o'clock: right ureteric orifice

Tech (a) Simple cystoscopy
(b) Chromo cystoscopy
(c) Ureteral catheterisation
(d) Retrograde pyelography
(e) Operating cystoscope:
(a) Rongeur
(b) Electrode
(c) Lithotrite
(8) Lavage and evacuation of bladder
Compl As in catheterisation

(4) BLADDER WASHES.

Ind. (a) Infection
(b) Hæmorrhage
(c) Pre instrumental or operative
(d) Post operative

Lotions: (1) **Saturated boric lotion + sterile water**
(2) **Oxycyanide of mercury** . 1 in 8000
(3) **Silver nitrate** 1 in 10,000
(4) Potash permanganate . 1 in 4000
(5) Mercurochrome . 1 in 1000
(6) Acriflavine : 1 in 10,000
(7) Acetic or phosph acid . 1 in 100
Alkaline cystitis

Quantity 3 ounces at a time
Temp 110° F
Receptacle. 2 Pints
Height 3 Feet
Methods. (1) Irrigating (two channelled) catheter
(2) Syringe and catheter
(3) Tube, funnel and catheter

(C) *Bladder operations*

(1) SUPRAPUBIC DRAINAGE.

Ind (A) **Acute urethral obstruction:**
(a) Acute urethritis or prostatitis
(b) Urethral trauma
(c) Impassable stricture
(B) **Chronic conditions:**
(a) Bladder and kidney infections
(b) Urinary obstructions
(c) Kidney inefficiency
(d) Post operative drainage
(e) Paralytic bladder: spinal conditions

Tech. (A) ASPIRATION:
Ind: **Acute retention by temp. cause:**
+ (a) Catheter contra indicated
(b) Catheterisation impossible

Tech (1) Aspiration with 20 c.cs syringe and long slender needle
(2) Do not empty the whole bladder
(3) Do not repeat more than thrice: · 8 hourly intervals
(4) Do not allow the bladder to get more distended
(5) Associate with
(a) Hot hip baths
(b) Antispasmodics

Compl Leakage into the cave of Retzius

(B) SELF RETAINING CATHETER:

Ind **Acute retention requiring prolonged treatment:**
+ (a) Catheterisation inadvisable
(b) Catheterisation impossible

Tech (1) Puncture with trocar and cannula
(2) Withdraw trocar
(3) Introduce de Pezzer catheter
(4) Withdraw cannula
(5) Gradual closed decompression

(C) CYSTOSTOMY

Ind (1) **Trauma:**
(a) Complete rupture urethra
(b) Rupture bladder
(c) Foreign bodies
(d) Hæmorrhage bladder. (clot retention)

(2) **Urinary sepsis:**
(a) Cystitis
(b) Pyelitis

(3) **Urinary obstruction:**
With back pressure:
(a) Urethral obstruction
(b) Prostatic obstruction

(4) **Pre and post-operative:**
(a) Urinary sepsis
(b) Urinary back pressure
(c) Urinary hæmorrhage

Tech (1) Keep the bladder full:
(a) Abstain from passing urine
or (b) Catheter + distension
(2) Suprapubic midline incision
(3) Rectus separation·
: Guide pyramidalis

(4) Exploration of Retzius cave
(5) Peel the peritoneum upwards
(6) Protect upper angle by gauze
(7) Anchor sutures in bladder wall
(8) Stab with narrow scalpel:
  (a) *From above downwards*
  (b) *Cutting edge towards symphysis*
(9) Finger exploration of bladder
(10) Treatment of the focus
(11) Drainage tube: stomy
  (a) Self retaining de Pezzer: For non infected cases
  (b) Wide bore drain: for
    (α) Infected bladder
    (β) Vesical clots
(12) Closure of the bladder:
  · Around the tube
(13) Anchoring of bladder to rectus
(14) Retzius drain
(15) Closure of the incision
(16) Anchoring bladder tube to skin

Drainage (A) **Temporary:**
  . Upto removal of the drainage tube (usually 48 to 72 hrs)
  (a) **Exhaust method:**
    (1) **Cathcart:**
      : Three way Y tube
    (2) ***Bunsen:***
      : Vacuum pump
    (3) **White:**
      : Suprapubic evacu.
  (b) **Siphon method:**
    : Tube connected to vacuum bottle
  (c) **Thompson & Wright:**
    : **Lamp-wick method**
    (1) 1 sq yard of gauze drawn out through 34" of Paul's soft tube
    (2) Sterilise by boiling
    (3) Wet the wick with boric lotion

(4) Tuck in ends.
(a) One into sinus
(b) Other into bottle
(5) Kaolin + vaseline
To the skin around.

(B) **Permanent:**
(a) **Overflow apparatus:**
Hamilton Irving's cup
(b) **de Pezzer catheter:**
With rubber urinal

(1) **Closed drain:**
Lead to a sterile bottle with antiseptic in it

(2) **Open drain:**
(a) Skin emollients
(b) Copious dressings
(c) Frequent dressings

(3) **Decompression drain:**
Ind Acute retention
Tech (a) Intermittent method
Release the clamp on the catheter every hour and let out 4 ounces
(b) Continuous method
Kidd's U tube

(2) SUPRAPUBIC CYSTOTOMY
Ind (1) Exploratory
(2) Therapeutic
(a) Bladder conditions
(b) Prostate enlargement
(c) Prostatic urethra
(d) Ureteral openings
(3) Drainage
(a) Infection
(b) Chronic back pressure
Contra Acute urinary retention
Anæsth (A) **Local** (a) Skin and subcutaneous
↓ (b) Muscle and aponeurosis
(B) **Intravenous sodium evipan**
(C) Spinal
(D) General

Steps (1) *Bladder lavage and distension*
12 ounces of boric lotion
(2) Incision midline
5" above symphysis to umbilic
(3) Incision of rectus sheath
(4) Separation of the recti
(5) Incision of transversalis fascia
(6) *Stripping up of peritoneal reflection*
(7) Exposure of bladder and Retzius cave
(8) Gauze protection of upper angle
(9) Anchor stitches in bladder wall
(a) Muscle fibres
(b) Veins
(10) *Aspiration of urine*
(11) Empty the bladder
(12) Stab with knife
(a) *Narrow bladed*
(b) *Cutting edge towards symphysis*
(c) *Cut from above downwards*
(13) Explore the cavity with a finger
(14) Treat the intra vesical condition
(15) Closure of the bladder
(a) Complete closure + urethral drain
Ind (α) Clean urine
(β) Renal function good
(γ) No distal obstruction
(b) Cystostomy
Ind (a) Infection
(b) Obstruction
(c) Renal incompetency
(d) Hæmorrhage
(e) Prostatectomy
(f) Fear of urine leakage
Tech (a) Rubber tube in upper angle
Of bladder incision
(b) *Suture the bladder incision*
Tightly around the tube
(c) Over sew by continuous stitch
(d) Fix the bladder to rectus
(16) Pre vesical drain
(17) Bring out
(a) Vesical tube at upper angle
(b) Pre vesical tube at lower angle
(18) Muscle suture interrupted
(19) Skin suture interrupted
(20) *Fix up the vesical tube to the skin*

Difficulties (*a*) **Injury to the peritoneum**

Etio (α) Tear while stripping
(β) Injury while stabbing

Pre treat (*a*) Be gentle
(*b*) Stab low and downwards
(*c*) Cutting edge towards symphysis
(*d*) *Enlarge the stab upwards*
After finger exploration of bladder cavity

Treat Suture + extraperitoneal drainage

(*b*) **Hæmorrhage**

Etio (*a*) Hypertrophied bladder big veins
(*b*) Papilloma bladder
(*c*) Prostatectomy

Treat (1) Under running the veins
(2) Adrenaline instillations
(3) Hot packs

(*c*) **Rupture bladder**

Etio (*a*) Small and thin bladder
(*b*) Rough handling

(3) OPERATIONS FOR VESICAL CALCULUS

(A) LITHOLAPAXY OR LITHOTRITY

Anæsth (*a*) General
(*b*) **Spinal**

Position Lithotomy or supine

Steps (1) *Bladder lavage and distension*
6 12 ounces of boric lotion
(2) Introduction of *closed* lithotrite
(3) Catching the stone at the trigone
(4) *Carry it to centre of the cavity*
(5) Crushing
(6) Repeat
(7) Close & withdraw the lithotrite
(8) Introduction of cannula
(9) Work the Bigelow s evacuator
(10) Repeat the whole process
Search and treat the pieces
(11) Bladder lavage and distension
(12) Cystoscopy
(13) *Tie in a catheter*

Post. treat (*a*) Bladder lavage
Twice a day for two days
(*b*) Withdrawal of catheter
On the third day

Compl: (a) Urethral shock
(b) False passage
(c) Hæmorrhage
(d) Trauma to the bladder
(e) Catheter fever
(f) **Ascending urinary infection**
(g) **Uræmia**
(h) Epididymo orchitis
(i) **Recurrence**

(B) SUPRAPUBIC LITHOTOMY.

Ind. (1) **Secondary stones:**
(a) Enlarged prostate
(b) Vesical growths or diverticulum
(c) Severe cystitis
(2) **Renal inadequacy**
(3) **Nature of calculus:**
(a) More than 2" in diameter
(b) Too hard a stone
(c) Impacted stone
(d) Stone in diverticulum
(4) Surgeon's experience

Steps: (1) Suprapubic cystotomy
(2) Digital exploration
(3) Introduction of stone forceps
(4) Catching and removal of the stone: Do not include the bladder wall
(5) Inspection of the removed stone:
(a) Fracture
(b) Facets
(6) *Digital exploration. for other stone*
(a) Bladder
(b) Prostatic urethra
(c) Lower ureters
(d) Bladder diverticulum if presen
(7) Closure of the bladder: with
(a) Catheter drain only
(b) Cystostomy drain only
(c) Cystostomy + catheter
(8) Retzius drain
(9) Closure of the wound

(C) PERINEAL LITHOTOMY:

Ind: Prostatic urethral stone

(4) CYSTECTOMY

(2) Suprapubic bladder exposure
(3) Protection of the wound
By silver nitrate swabs
(4) Isolation and mobilisation of the part
(a) Extravesically
(b) Intravesically
(5) Removal of the part
By d athermy knife
(6) Closure of the defect
Around a tube in the bladder
(7) Pre vesical drain
After treat (a) Removal of pre-vesical drain 4th day
(b) Removal of vesical drain 7th day

(B) TOTAL CYSTECTOMY
Ind Malignancy
(a) More extensive for partial operation
+ (b) Non involvement of peri vesical organs
Except prostate and vesicles
Investigations (1) Renal function
(2) Urinary sepsis
(3) General condition
Stages (1) Prel minary suprapubic cystostomy
↓ (2) 3 Weeks
↓ (3) Preliminary ureteral transplantation
Winsbury White two-stage operation
↓ (4) One month
↓ (5) Total cystectomy
Tech (a) Perineal approach
↓ (b) Separation of
(α) Rectum & peritoneum
from (β) Urethra prostate & vesicles
↓ (c) Suprapubic approach
Isolation & mobilisation of bladder
(d) Closure of peritoneal tears
(e) Ligature and division of
Lateral ligaments of the bladder
(f) Empty the bladder
(g) Ligature and division of
Pubo-vesical lig ments
(h) Division of
Bladder neck
() Removal of the bladder
(j) Closure with d~
(a) Suprap
(

(5) EXCISION BI
Steps (1) Cy
(2) Su

or (2) **Extraperitoneal lateral approach**

Tech · Para rectus L incision

Advant (a) More room

(b) Easier mobilisation

(c) Easier ureteral identification

(3) De peritonisation of bladder

(4) Isolation of the sac

· Over the finger in its lumen

(5) Isolation and protection of

(a) Peritoneum

(b) Ureter

(c) Vas deferens

(d) Rectum

(e) Int. iliac vessels

(6) Excision of the sac

(7) Closure of the bladder defect

(8) Vesical and extra vesical drain

(9) Closure

Compl (1) Urinary sepsis

(2) Urinary calculus

(3) Hæmorrhage

(4) Trauma to ureters

(5) Enlarged prostate

(6) Malignancy

(7) Adhesions

(8) Residual urine

(9) Anuria → uraemia

(6) INTRATHECAL ALCOHOL INJECTION:

Ind **Intractable pelvic pain** ·

(a) Carcinoma bladder

(b) Carcinoma cervix

(c) Carcinoma prostate

(d) Carcinoma rectum

Tech · (1) Lumbar puncture.

First lumbar interspace

(2) Injection intrathecal:

1–2 c cs of absolute alcohol

(3) Trendelenburg + side of pain up:

For 10 min to 3 hours

Compl Transitory. (a) Week extremities

(b) Difficult sphincter control

(D) *Post-operative measures.*

(1) *Bladder drainage*: (See under Cystostomy)

(a) **Urethral**: Indwelling catheter for 10 days

(b) **Suprapubic**:

(α) Self retaining catheter

(β) Cystostomy

(2) Suprapubic bladder exposure
(3) Protection of the wound
By silver nitrate swabs
(4) Isolation and mobilisation of the part
(a) Extravesically
(b) Intravesically
(5) Removal of the part
By diathermy knife
(6) Closure of the defect
Around a tube in the bladder
(7) Pre vesical drain
After treat (a) Removal of pre vesical drain 4th day
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Ind Malignancy
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Lateral ligaments of the bladder
(f) Empty the bladder
(g) Ligature and division of
Pubo-vesical ligaments
(h) Division of
Bladder neck
(i) Removal of the bladder
(j) Closure with drainage
(a) *Suprapubic*
(b) Perineal

(5) EXCISION BLADDER DIVERTICULUM
Steps. (1) Cystoscopy + ureteral catheterisation
(2) Suprapubic cystotomy

or (2) Extraperitoneal lateral approach:
Tech: Para rectus L incision
Advant. (*a*) More room
(*b*) Easier mobilisation
(*c*) Easier ureteral identification
(3) De peritonisation of bladder
(4) Isolation of the sac:
: Over the finger in its lumen
(5) Isolation and protection of
(*a*) Peritoneum
(*b*) Ureter
(*c*) Vas deferens
(*d*) Rectum
(*e*) Int. iliac vessels
(6) Excision of the sac
(7) Closure of the bladder defect
(8) Vesical and extra vesical drain
(9) Closure

Compl. (1) Urinary sepsis
(2) Urinary calculus
(3) Hæmorrhage
(4) Trauma to ureters
(5) Enlarged prostate
(6) Malignancy
(7) Adhesions
(8) Residual urine
(9) Anuria -> uraemia

(6) INTRATHECAL ALCOHOL INJECTION:

Ind: **Intractable pelvic pain:**
(*a*) Carcinoma bladder
(*b*) Carcinoma cervix
(*c*) Carcinoma prostate
(*d*) Carcinoma rectum

Tech: (1) Lumbar puncture:
. First lumbar interspace
(2) Injection intrathecal:
. 1–2 c cs of absolute alcohol
(3) Trendelenburg + side of pain up:
: For 10 min. to 3 hours

Compl: Transitory. (*a*) Week extremities
(*b*) Difficult sphincter control

(D) *Post-operative measures.*

(1) *Bladder drainage*: (See under Cystostomy)
(*a*) **Urethral**: Indwelling catheter for 10 days
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(h) Division of
Bladder neck
(i) Removal of the bladder
(j) Closure with drainage
(a) Suprapubic
(b) Perineal

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Steps (1) Cystoscopy + ureteral catheterisation
(2) Suprapubic cystotomy

or (2) Extraperitoneal lateral approach
Tech Para rectus L incision
Advant (a) More room
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(c) Easier ureteral identification
(3) De peritonisation of bladder
(4) Isolation of the sac ·
Over the finger in its lumen
(5) Isolation and protection of
(a) Peritoneum
(b) Ureter
(c) Vas deferens
(d) Rectum
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(6) Excision of the sac
(7) Closure of the bladder defect
(8) Vesical and extra vesical drain
(9) Closure

Compl (1) Urinary sepsis
(2) Urinary calculus
(3) Hæmorrhage
(4) Trauma to ureters
(5) Enlarged prostate
(6) Malignancy
(7) Adhesions
(8) Residual urine
(9) Anuria → uraemia

(6) INTRATHECAL ALCOHOL INJECTION:

Ind **Intractable pelvic pain** ·
(a) Carcinoma bladder
(b) Carcinoma cervix
(c) Carcinoma prostate
(d) Carcinoma rectum

Tech (1) Lumbar puncture:
First lumbar interspace
(2) Injection intrathecal:
1–2 c cs of absolute alcohol
(3) Trendelenburg + side of pain up.
For 10 min to 3 hours

Compl Transitory. (a) Week extremities
(b) Difficult sphincter control

D) *Post-operative measures*.

(1) *Bladder drainage* · (See under Cystostomy)
(a) **Urethral**: Indwelling catheter for 10 days
(b) **Suprapubic**:
(α) Self retaining catheter
(β) Cystostomy

(1) **Closed drain** in a sterile bottle
(2) **Open drain** in the dressings
(a) **Ordinary drainage**
(b) **Gradual decompression drainage**
(c) **Siphon drainage**

(2) *Dressings*
(a) **Protection of the skin:**
Kaolin + vaseline
(b) Copious oft-changed dressings
(c) **Removal of drains:**
(α) Urethral 10th day
(β) Suprapubic Retzius 3rd day
(γ) Suprapubic vesical 6th day
(d) **Bladder irrigations:**
Ind (α) Urinary sepsis
(β) Urinary hæmorrhage
Lotions (α) Mercury oxycyanide } See under
(β) Silver nitrate } Bladder washes
Route → Catheter → suprapubic tube → out

(3) *Medicinal*
(a) **Diuretics** and hydrotherapy
(b) **Urinary antiseptics**
(c) Laxatives
(d) Tonics

(E) *Post-operative complications*
(1) **Shock:**
Treat Anti shock measures
(2) **Hæmorrhage:**
Treat (a) General anti hæmorrhagic
(b) Local (α) Hot irrigations
(β) Instillations
Adrenaline
Silver nitrate
(3) **Ascending urinary sepsis:**
Treat (a) Urinary antiseptics Cylotropin
Neotropin
(b) Bladder lavages
(4) **Anuria → uræmia:**
Treat (a) Hydrotherapy
Oral, rectal, subcutaneous, venous
(b) Diuretics
Sodium sulphate. 42 85 gms. to litre
2 to 3 litres per day
: Intravenous continuous drip
(5) **Sepsis of the wound:** Sloughing
Treat Protection of the skin. kaolin + vaseline

(6) **Pelvic cellulitis :**

Cause Extravasation of urine

Treat : (a) Retzius drain
(b) Bladder drain
(c) Removal of all stitches
(d) Multiple incisions
(e) Anti toxic and anti uræmic measures

(7) **Unhealing suprapubic fistula :**

Cause: Urethral obstruction

Treat : Indwelling rubber catheter.
: For 10 days

(8) **Chest complications**

(9) **Delirium nervosum**

(10) **Ventral hernia**

(X) IMPORTANT POINTS

(1) First operation for rupture bladder was done in 1859 by Dr. Walther, a practitioner of Pittsburg, on a blacksmith

(2) *Keep every patient who has had an abdominal contusion, under constant observation until he has passed an adequate amount of normal urine Pass a catheter in every suspected case as early as possible, preferably in an operation theatre*

(3) Bladder must be emptied *after the patient is anæsthetised* in cases of blind suprapubic drainage, to avoid injury to the bladder

(4) Intraperitoneal rupture of the bladder is more common (80%) than extraperitoneal rupture (20%).

(5) Prognosis of *intraperitoneal rupture of the bladder* varies with its duration, *immediate exploration* is far better than 'wait and see' policy

(6) *At all times, if any reasonable suspicion exists as to the presence of rupture bladder, it is better to explore than to wait for physical signs*

(7) *Catheterise every suspected case of rupture bladder and that too in an operation theatre*

(8) *Treatment of rupture bladder :*
(a) *Suprapubic cystotomy*
↓ (b) *Exploration.*
(α) *Intraperitoneal*
(β) *Extraperitoneal*
(γ) *Vesical*
↓ (c) *Suture of the tear*
↓ (d) *Toilet*

↓ (e) *Drainage:*
  (α) *Peritoneal: if necessary*
  (β) *Vesical:*
    (1) *Suprapubic*
    (2) *Urethral*
  (γ) *Retzius.*

(9) Pyelitis is the most common cause of chronic and recurrent cystitis

(10) B. coli is the commonest organism in cystitis.

(11) Cardinal symptoms in acute cystitis:
  (a) Frequency
  (b) Dysuria
  (c) Pyuria.

(12) In reflex cystitis, pyuria is absent.

(13) It is futile and even dangerous to prescribe acids in cases in which, in spite of ingestion of the acid, the urine remains *alkaline, as in cases of proteus infection.*

(14) The first suprapubic lithotomy was done in 1560 by Nicholas Frankau of Laussane.

(15) *The commonest cause of vesico intestinal fistula is diverticulitis of the colon, but carcinoma of the bowel* vies with it for priority Preliminary colostomy is a necessity before radical operation

(16) In traumatic rupture of the bladder, when operation is performed within 12 hours, the mortality is 11%; when it is delayed to 24 hours, it is 55%.

(17) *Cardinal rules for treatment of cystitis:*
  (A) *Acute stage:*
    (a) General and medical treatment only
    (b) *No instrumentation of any kind*
  (B) Subacute stage:
    (a) General and medical treatment
    + (b) Bladder lavage and instillations
  (C) *Chronic stage:*
    (a) General and medical treatment
    + (b) *Bladder lavage and instillations*
    + (c) *Removal of etiology.*

(18) *Insidious cystitis may be the earliest and the only symptom of tuberculous kidney*

(19) Causes of obscure urinary frequency:
  (a) Pseudo membranous trigonitis:
  Treat: Instillation of 4 drachms of 1–5% silver nitrate
  (b) Infection by Trichomonas vaginalis

(20) *Lateral pictures* after instillation of 3% sodium iodide are best *for the diagnosis of bladder diverticulæ.*

(21) It is generally agreed that malignant tumours of the bladder tend to remain confined to the bladder cavity.

(22) Condition of the bladder in spina bifida:

(a) Spastic sphincter + spastic detrusor
(b) Relaxed sphincter + spastic detrusor
(c) Relaxed sphincter + relaxed detrusor.

(23) It should only be after conservative measures have failed and after puberty, that any operative procedure such as presacral neurectomy or plastic sphincter, should be entertained for bladder paralysis in spina bifida.

(24) *In spinal cord injuries, catheter is a grand executioner and whatever course is adopted, under no circumstances should the patient be catheterised Suprapubic self-retaining catheter is the best.*

(25) Contracted bladder is the *bete noire* of urological surgery and is the end result of chronic diffuse cystitis

(26) The first sign of disseminated sclerosis, tabes dorsalis or even a cerebral or spinal tumour is interference with the function of micturition.

(27) Age incidence in benign bladder tumours is 25 to 40, while that in malignant ones is 40 to 60

(28) Association of pain and hæmaturia

(a) *Painful slight hæmaturia . urinary stone*
(b) *Painless profuse hæmaturia urinary papilloma.*

(29) Difference between papilloma and carcinoma:

(a) Papilloma·
: Pedicled; long villi
: No infiltration

(b) Carcinoma
: Sessile, irregular stunted villi
: Infiltration

(30) A growth covered by phosphates is generally malignant and resembles a stone

(31) Special procedures in bladder papilloma

(a) Protection of incision margins
(b) Use of diathermy
(c) Silver nitrate instillations
(d) Repeated cystoscopic inspections.

(32) *Growth of the bladder felt per rectum is never innocent.*

(33) A patient must be cystoscoped at 3 monthly → 6 monthly → yearly → 2 yearly intervals for the rest of his life after an operation for removal of urinary papilloma.

(34) *Every urinary papilloma case should be kept under cystoscopic observation*

(35) Bilateral ureterostomy just medial to anterior superior iliac spine is no greater inconvenience than a colostomy

(36) Do not allow tumour cells to come in contact with incision margins in operation for urinary papilloma

(37) *Bladder stones in order of frequency*
   (a) *Uric acid polished*
   (b) *Phosphates chalky*
   (c) *Calcium oxalate mulberry*

(38) The most common site for a bladder growth or diverticulum is above and external to an ureteric orifice

(39) Bladder stone in children
   (a) Crying micturition
   (b) Penile erection
   (c) Masturbation
   (d) Ammoniacal left palm

(40) *Bladder stone in children look for phimosis*

(41) *Clinical picture of bladder stone*
   (a) *Terminal dysuria*
   (b) *Terminal hæmaturia*
   (c) *Effect of work and rest*

(42) Most common vesico intestinal fistula is between the *bladder and the pelvic colon due to diverticulitis or* malignancy

(43) Causes of post operative suprapubic fistula
   (a) Prolapse vesical mucosa
   (b) *Unrelieved distal obstruction*
   (c) Overlooked infected diverticulum

(44) One of the earliest signs of tabes dorsalis is trabeculation of the bladder

(45) Majority of diverticulæ are situated above and external to one or other of the ureteric orifices

(46) When prostatic enlargement and a diverticulum co exist, excision of the diverticulum with cystostomy should precede prostatectomy

(47) Principal cause of death in carcinoma bladder is ascending pyelonephritis.

(48) *Open cystostomy should never be carried out in the presence of acute urinary retention as it is extremely liable to produce anuria due to sudden decompression*

(49) *In acute retention, always decompress slowly*
   (a) *Letting out 4 ounces every hour*
   (b) *Kidd's U tube*

(50) *Avoid injury to peritoneum in bladder operations*
   (a) *Trendelenburg position + Good anaesthesia*
   (b) *Distension of the bladder*
   (c) *Delicate dissection of peritoneum off bladder*

(b) Ventral epigastric or umbilical hernia
- (α) Aggravation on lying down
- (β) Relief by standing

(65) *Pure uric acid stones cast no shadows*

(66) Unhealing suprapubic fistula nearly always denotes urethral obstruction

(67) Causes of vesico intestinal fistula
- (a) Appendicular abscess
- (b) Diverticulitis
- (c) Regional ileitis
- (d) Carcinoma
- (e) Congenital rectal abnormality

(68) *Remember bladder in direct inguinal herniotomies*

(69) *It is criminal not to examine for kidney efficiency before any genito urinary operation, especially for a long standing urinary trouble*

(70) *Sudden evacuation of bladder is disastrous in acute urinary retention, always decompress gradually*

(71) *Urinary drainage, suprapubic or urethral and hydro therapy with diuretics are the measures to be adopted in renal inefficiency*

(72) *Acute urinary retention is best relieved by conservative methods*

(73) Drainage removal
- (a) Pre vesical 3rd day
- (b) Vesical (α) Suprapubic 7th day
  - (β) Urethral 10th day

(74) *Most usual post operative complications after any urinary operation*
- (a) *Ascending urinary sepsis*
- (b) *Anuria with uræmia*
- (c) *Chest complications*
- (d) *Delirium nervosum*

(75) *Do not forget to be sure that there are no multiple stones in the bladder*
- (a) Inspect the stone
  - (α) Fracture
  - (β) Facets
- (b) Explore the bladder
- (c) Explore the prostatic urethra
- (d) Explore the ureteric orifices
- (e) Explore the diverticulum if present.

(76) *Do not forget to empty the bladder before opening it, always protect the peritoneum by a towel*

(77) Anchor sutures in the bladder wall are useful as
(a) Hæmostats under run veins
(b) Retractors and pullers
Get a bite of muscular coat only.

(78) *Catheterisation should never be performed without.*
(a) *Cleansing the glans*
(b) *Irrigating the urethra*
(c) *Surgically clean hands*
(d) *Sterile instruments*
(e) *Sterile lubricant*

(79) After acute urinary retention has been relieved, the patient must be kept in bed for at least 12 hours

(80) *Sudden relief of acute retention or of chronic retention with overflow is catastrophic, gradual decompression of the bladder must be an inviolable rule in such cases*

(81) Indications for presacral neurectomy
(a) Hydro ureter
(b) Bladder paralysis
(c) Intolerably painful cystitis

(82) Deep X Ray therapy and radium therapy for malignant bladder have been dismal failures

(83) Classification of epithelial tumours of the bladder.
(a) Papillary
(b) Papillary + infiltrating
(c) Infiltrating

(84) Transient hæmaturia is the first sign of a bladder tumour Pain is not a symptom of early cancer, it usually means 'too late'

(85) *Pain is the prominent feature of urinary stone; hæmaturia is the prominent feature of urinary growth*

(86) *If sodium bicarbonate is added to cocaine hydrochloride, the anæsthetic action is increased at least six folds,* due to ready dissociation of cocaine bicarbonate formed

(87) Summary of catheter scales
(a) French 21 (circumference in millimetres)
(b) American 14 (2/3rd the French)
(c) English 12 (2 less than American)

(88) *In any given case, the catheter which should be used is the largest which can be used, work downwards from instruments which are too large until one which will pass is reached*

(89) *Size of normal adult urethra*
(a) *English: 12*
(b) *French. 21.*

(90) There is a close relationship between the circumference of the penis and the urethral lumen

Sign Urethrogram
Treat Excision
(5) URETHROCELE
Etio Females
Site Urethro-vaginal septum (inferior wall)
Clinic (a) Tender swelling in vagina
(b) Frequent painful micturition
(c) Incomplete evacuation of bladder
(d) Excoriation of vulva due to overflow
(e) Painful and difficult coitus
Diag Cysto urethrogram
Treat Simple incision of the pouch
(4) DOUBLE URETHRA Rare
(5) PROLAPSE URETHRA
(6) EPISPADIAS
Def Congenital deformity of urethra and penis in which the urethra opens on the dorsum of the cleft penis
Varieties (1) Epispadias glandis rare
(2) Epispadias penalis rare
(3) Complete epispadias + ectopia vesicae
Clinic An open urethral gutter on the dorsum of the penis
Path Hypospadias with torsion of the penis?
Association (a) Rudimentary penis
(b) Mal-descent of testis
(c) Cleft scrotum
(d) Non united symphysis
(e) Inguinal hernia
Compl (1) Incontinence
(2) Urine irritation
(3) Ascending urinary infection
(4) Pseudo hermaphroditism
Treat Plastic operations
(1) Cantwell (Carson s Operative Surgery, Vol. II)
(2) Thompson provision of sphincter
(7) HYPOSPADIAS
Def (a) Arrested development of urethra
↓ (b) Failure in the formation of urethral floor
↓ (c) *Premature urethral opening on the under surface of penile body*
Varieties (A) **Hypospadias glandis**
Cause Failure of meeting between
(a) Epithelial invagination of glans
& (b) Uro-genital sinus urethra
Clinic Urethral opening at the glans base
Compl (a) Meatal stenosis
(b) Hooded prepuce
(B) **Hypospadias penis.**
Cause Arrested development of uro genital sinus

Clinic (1) Urethral opening at peno scrotal junct.
(2) Moist red furrow on penile under surface
(3) Bent under developed penis

Compl: (a) Difficult micturition
(b) Eczema scrotum
(c) Sterility mechanical

(C) **Hypospadias perinealis:**

Cause Arrested development of urogenital sinus

Association (a) Undescended testis
(b) Cleft scrotum
(c) Rudimentary penis

Clinic **External pseudo-hermaphroditism:**
(a) Appearance of female genitalia
(b) Urethral opening in the perineum

Compl (1) Psychic and mechanical impotence
(2) Squatting micturition

Complication: of hypospadias in general

(1) **Meatal stricture:**
(a) Back pressure
(b) Sepsis
(c) Calculus
(d) Straining syndrome hernia and piles

(2) **Difficult micturition:**
(a) Scrotum wetting
Hypospadias penis
(b) Squatting micturition
Hypospadias perinealis

(3) **Sterility and difficult coitus:**
(a) Mechanical
Hypospadias penis
(b) Functional + mechanical.
Hypospadias perinealis

Treat. (A) **Hypospadias glandis:**
Requires no treatment

(B) **Hypospadias penis:**
(1) **Straightening of penis:**
. By division of band
(2) **Suprapubic cystostomy:** Preliminary
(3) **Plastic operations.**
(a) **Bucknall:**
Tech (α) Implant penis on scrotum
(β) Detach penis from scrotum:
With: Scrotal skin as under surface
Age: 8–9 years

(b) **Winsbury White:**
Tech (α) Transplantation of preputial muc. mem on to the front of scrotum by pedicle graft
↓ (β) Bucknall
Steps (1) Transplantation of half of prepuce with muc. mem. up, to a raw margin in scrotum
↓ (2) Transplantation of whole prepuce with muc mem up, to the front of the scrotum
↓ (3) Implantation of penis to the transplanted foreskin
↓ (4) Detachment of penis from the front of the scrotum, with its reconstructed urethra
↓ (5) Obliteration of raw surfaces
Age 4 years
(c) **Edmund**

(C) **Hypospadias perinealis**:
Leave alone

(8) CONGENITAL OBSTRUCTION IN FEMALE URETHRA
(A) Diaphragm and valve
Cause Persistence of cloacal membrane
Site External orifice
Compl Back pressure
Treat (a) Incision
(b) Rupture with a sound
After treat Intermittent dilatation
(B) Stricture
Site External meatus
Clinic Frequent micturition
Compl Back pressure
Treat Meatotomy
After-treat Intermittent dilatation

(II) URETHRAL TRAUMA:

(1) *URETHRAL WOUNDS*

Varieties (A) **From within**. *False passage*
Etio (1) Faulty catheterisation
(2) Urethral obstruction
(a) Stricture
(b) Enlarged prostate
Clinic (a) Obstruction to the catheter
↓ (b) Application of force
↓ (c) Sudden swift painful progress
↓ (d) Hæmorrhage + no urine
+ (e) Impaction of the catheter

(B) **From without:**
Etio: Gunshot or stab wounds
Site: Penile or bulbous portion

Compl: (1) Urethral **shock**
(2) Urethral **hæmorrhage**
(3) **Extravasation of urine**
(4) Urinary **sepsis**
(5) Urethral **stricture**

Treat: (A) Tie in a catheter: for 4 days
(B) External urethrotomy + suture over **catheter**
(C) **Suprapubic cystostomy:**
Ind: (α) Severe injuries
(β) Extravasation of urine

(2) RUPTURE URETHRA:

Etio. (*a*) Erections penile urethra
(*b*) Falls on perineum: bulbous urethra
(*c*) **Fracture pelvis:** Membranous urethra

Types· (A) Total rupture: through all coats
(B) Subtotal rupture.
(*a*) Interstitial corpus
(*b*) External. sheath
(*c*) Internal. mucous membrane
(A) **Complete:** Whole circumference
(B) Incomplete or **partial:** part of the circum.

Sites: (1) Penile } . **extra-pelvic**
(2) Bulbous }
(3) Membranous **intra-pelvic**

Clinic. (1) History of trauma.
(*a*) Blow on perineum· bulbous
(*b*) Fracture pelvis. membranous
(2) Signs and symptoms.
(A) Penile urethra.
: Hæmorrhage independent of mict.
(B) Bulbous urethra:
(*a*) **Independent urethral haemorr.**
(*b*) **Perineal haematoma**
(*c*) Painful retention of urine
(*d*) Difficult or failed catheterisation
(*e*) **Superficial extravasation of urine**
(C) Membranous urethra:
(*a*) **Hæmorrhage with urine only**
(*b*) **No perineal hæmatoma**
(*c*) Painful retention of urine
(*d*) Difficult or failed catheterisation
(*e*) **Deep extravasation of urine**
(*f*) Rigid lower abdomen
(*g*) P. R.: tender painful swelling

Diff diag (A) *Anterior urethra*
- (a) Continuous hæmorrhage
- (b) Distended bladder
- (c) **Perineal hæmatoma**
- (d) Superficial extravasation
- (e) Difficult catheterisation

(B) *Posterior urethra*
- (a) Micturition hæmorrhage
- (b) **Distended bladder**
- (c) P R tender swelling
- (d) Deep extravasation
- (e) Difficult catheterisation

(C) *Extraperitoneal bladder rupture*
- (a) No independent hæmorrhage
- (b) Non distended bladder
- (c) P R negative
- (d) Deep extravasation
- (e) **Easy catheterisation**, With bloody urine

Compl (1) **Shock**
(2) **Acute urinary retention**
(3) **Extravasation of urine**
- (A) Superficial
  - (α) Penile urethra
  - (β) Bulbous urethra
- (B) Deep
  - (α) Membranous urethra
  - (β) Extraperitoneal bladder rupture

(4) **Sepsis**
- (a) Cellular (α) Superficial
  (β) Deep
- (b) Ascending urinary
- (c) General septicæmia

(5) *Stricture* occlusion
(6) **Fistulæ**

Treat (1) *Warn the patient not to micturate*
↓ (2) *Pass in a catheter* in operation theatre
- (A) If successful tie it in
- (B) If unsuccessful
  - (a) Cystostomy and retrograde catheter
  - (b) Antegrade catheter
  - (c) Perineal exposure of both catheters
  - (d) Guide in the antegrade catheter

↓ (3) *Suture of the urethra over the catheter*
In complete rupture
↓ (4) *Treat the extravasation of urine*

↓ (5) *Suprapubic drain:*
(a) Vesical
(b) Retzius

(A) *Extrapelvic: bulbous and penile urethra*
(a) *Incomplete rupture:*
(1) Perineal exposure
(2) Evacuation of hæmatoma
(3) Antegrade catheterisation:
: Suture urethra over it
or (3) **Suprapubic cystostomy**
(4) Treatment of extravasation
(b) *Complete rupture.*
(1) Suprapubic cystostomy
(2) Retrograde and antegrade catheters
(3) Perineal exposure of both catheters
(4) Excision of damaged tissues:
· With interrupted sutures
(5) Suture of the urethral roof only
(6) Closure of the bladder: with
(α) Suprapubic de Pezzer
(β) Retzius drain

Difficulty · Non apposition of urethral ends:
(α) Change from lithotomy posture
·(β) Mobilisation of corpus spongio.

After-treat: (α) Suprapubic de Pezzer out:
. On 14th day
(β) Irrigations of perineal wound.
For two weeks
(γ) Ant urethroscopy + dilatation:
After two weeks

(B) *Intrapelvic: membranous urethra*
(1) Suprapubic cystotomy
(2) Exposure of Retzius cave
(3) Retrograde catheterisation:
No 21 French or no. 12 English rubber
↓ (a) *Incomplete rupture:*
: Draw in an antegrade catheter by tying it to retrograde catheter
(b) *Complete rupture:*
(4) Perineal exposure of retrograde catheter
(5) Debridement of lacerated tissues
(6) Antegrade catheter upto perineal wound
(7) Tie together both catheters
(8) Guide antegrade catheter into bladder:
(α) Attach a thread to the tip
(β) Bring it out through cystostomy

(9) Suprapubic closure: with
(α) Catheter thread through cystostomy tube
(β) Retzius drain
(10) Perineal wound packing

After treat (1) Bladder lavage: B D.
(2) Change of catheter. every 4 days
(a) Tie new catheter to outer end of indwelling catheter
↓ (b) Pull on the thread through suprapubic tube
(3) Prevesical tube. out on 5th day
(4) Suprapubic tube & indwell. catheter: Out on 14th day
(5) Intermittent dilatation: after 6 weeks

(C) *Rupture urethra with extravasation urine*:
(1) Preliminary cystotomy
(2) Retrograde catheterisation
(3) Perineal section
(4) Antegrade catheterisation
(5) Union of two catheters
(6) Antegrade catheter guided into bladder
(7) Drains
(a) Vesical drain
(b) Retzius drain
(c) Perineal wound unstitched
(8) Multiple incisions in extravasated tissues

After treat Remove the catheter at the end of 48 hours

(3) FOREIGN BODIES URETHRA

Etio. (1) Sexual aberrations
(2) Accidental insertions children
(3) Auto treatment of retention urine
(4) **Impacted calculus**

Sites. (a) Fossa navicularis
(b) Bulbous urethra

Clinic: (1) History or no history
(2) Urethral discharge
(3) Urinary obstruction
(4) **Palpation**
(5) Signs of complications

Compl: (a) **Acute retention**
(b) Stone formation
(c) Peri urethral abscess
(d) Urethral fistula
(e) Urethral stricture

Treat: (1) **Extraction**
(a) Urethral forceps. near the ext. meatus

(b) External urethrotomy: bulbous urethra
(c) Suprapubic cystotomy: posterior urethra
+ (2) **Diuretics and urinary antiseptics**
↓ (3) **Prophylactic recurrent dilatation**

(4) URETHRAL SHOCK:
Etio: **Urethral instrumentation**
Path: Reflex nervous inhibition
Clinic: (1) Shock
+ (2) Unconsciousness
+ (3) Respiratory failure
} → Death
Treat: (a) Artificial respiration
(b) Stimulants
Prophylaxis: (1) **Efficient urethral anæsthesia**
(2) Gentle handling
Prognosis: Grave

(III) URETHRAL SEPSIS:

(1) URETHRAL FEVER:
Syn: **Catheter fever**
Def: Toxæmia due to **septic absorption through an urethral abrasion,** due to instrumentation or operation, after the passage of septic urine over it
Clinic: (a) Fever with rigors
(b) General **toxæmia**
Compl: Suppression of urine → uræmia
Treat: (a) **Pre and post** instrumentational:
. **Urinary antiseptics** and diuretics
(b) Asepsis and gentle handling

(2) URETHRITIS.

(A) ACUTE URETHRITIS.
Etio: (1) **Ascending**. (a) **Gonorrheal**
(b) Instrumental
(2) **Descending**: (a) Upper urinary sepsis
(b) Bacilluria
(3) **Local**: (a) Trauma: rupture
: false passages
(b) Calculus: impaction
(c) Stricture
(d) Growths
Clinic. (1) **Dysuria** with retention
(2) **Pus** per urethra
(3) General toxæmia
Sign: Examination of the discharge
Compl: (1) **Acute retention**
(2) **Ascending infection:**
(a) Urinary
(b) Genital: epididymo-orchitis

Treat **Conservative:** *No instrumentation*
- (a) Urinary antispasmodics and sedatives
- (b) Urinary antichemicals alkalies
- (c) Hydrotherapy and diuretics
- (d) Hot hip baths

(B) CHRONIC URETHRITIS

Etio
- (a) **Residual:** Sequela of acute
- (b) **Gonorrheal**
- (c) Diabetic
- (d) Tuberculous rare
- (e) Septic basilluric
- (f) Granular in women

Clinic
- (1) **Frequency** of micturition
- (2) **Dysuria**

Compl
- (1) **Exacerbations** of acute urethritis
- (2) Urinary retention
- (3) **Ascending infection:**
  - (a) Urinary cystitis
  - (b) Genital epididymo orchitis

Treat
- (1) **Conservative:**
  - (a) Diuretics and hydrotherapy
  - (b) Urinary antiseptics
  - (c) Urinary antichemicals
- (2) **Instrumental:** *Not in complications*
  - (a) Passage of bougies or sounds
    Urethral massage over them
  - (b) Instillations of
    - (α) Mercurochrome
    - (β) Acriflavine
  - (c) Endoscopic applications

(C) PERI URETHRITIS

Etio
- (1) **Trauma:** Rupture, false passage, F B
- (2) **Infection:** Urethritis
- (3) **Obstruction:** Stricture, stone
- (4) **New growths**
- (5) **Specific.** Bilharziasis

Varieties
- (I) *Chronic indurative peri urethritis*
  Peri urethral indurative fibrosis
  Associated with multiple fistulæ
- (II) *Peri urethral abscess*
  - Etio
    - (a) **Gonorrheal urethritis** Penile
    - (b) **Stricture:** Bulbous
    - (c) **Impacted stone**
  - Clinic
    - (a) **Tender induration** ·
      On penile under surface
    - ↓ (b) Fluctuating swelling
      On penile under surface
    - (c) Retention of urine
    - (d) Presence of etiology

Compl. (1) **Extravasation of urine**
(2) **Urinary fistula**

Treatment (A) *Penile:*
(1) **Intra-urethral drainage:**
(a) Passage of a sound
or (b) Pass an urethroscope
(2) **Aspiration**
By syringe + needle

(B) *Bulbous.*
(1) **Aspiration**
or (2) **Perineal drainage**
+ (C) **Treatment of etiology:**
After the acute phase has subsided

After treat (1) Antiseptic baths
(2) **Intermittent dilatations**
(3) Treatment of etiology

(III) *Extravasation of urine*

Def. Infiltration of cellular tissues with urine, leading to cellulitis and gangrene or multiple urinary fistulæ

Varieties (A) *Superficial or subcutaneous*

Etio (a) Rupture anterior urethra
(b) False passage
(c) Peri urethral abscess

Path Extravasation of urine into
(a) Superficial perineal pouch
(b) Scrotum and penis
(c) Lower abdominal wall
Extravasation does not enter
(a) Thighs
(b) Peri anal area

Clinic (a) Signs of etiology
(b) Diffuse œdematous subcutaneous cellulitis
(c) General toxæmia

Compl (1) **Gangrene**
(2) **Septicæmia**
(3) Urinary fistulæ
(4) Chest complication
(5) Uræmia

Treat (a) **Treatment of etiology:**
Rutherford's sutureless operation.

(1) Suprapubic cystotomy
(2) Retrograde catheter
(3) Perineal section

↓ (b) **Urinary drainage:**
(1) Suprapubic
Cystostomy
(2) Perineal in strictures
(3) Meatal
Indwelling catheter

↓ (c) **Treat extravasation**
(1) *Multiple incisions*
(2) *Wounds irrigations*
H_2O_2 or Carrel
Dakin

+ (d) **General treat of sepsis:**
(1) Urinary sepsis
Hexamine
(2) Cellulitis
Sulphonamides

+ (e) **Treat renal failure:**
Due to back pressure

+ (f) **General supporting treat.**
Tonics, hæmatinics

+ (g) **Treat complications:**
As they appear

(B) *Deep or intrapelvic*

Etio (a) **Urethra:**
Intrapelvic rupture
(b) **Bladder:**
(α) Extraperitoneal rupture
(β) Suprapubic puncture
(c) **Ureter:** Rupture
(e) **Retzius:** Inefficient drain

Path Urinary infiltration of pelvic cellular tissues

Clinic Diffuse submuscular induration in the hypogastric region, rising up from behind the symphysis pubis

Compl (a) Pelvic cellulitis → abscesses → fistulæ
(b) Septicæmia

Treat (1) **Treatment of etiology**
(2) **Urinary drainage:**
(a) Suprapubic cystostomy
(b) Retzius drain

(c) Indwelling catheter
(d) Perineal drain
(3) **Multiple incisions**
(4) Other treatment as in (A)

Operative treatment for extravasation of urine:
(1) Spinal anæsthesia
(2) Bougie or Cock's operation
(3) Lithotomy position
(4) External urethrotomy
(5) Bladder drain
(6) Multiple incisions:
: Into infiltrated tissues

After-treat. (a) Irrigations:
(α) Hydrogen peroxide
(β) Carrel—$KMnO_4$
(b) Intravenous therapy:
(α) Drip sodium sulphate
(β) Glucose saline
(c) Intermittent dilatation of stricture

(IV) URETHRAL STRICTURE:

Def: Narrowing of the lumen of the urethra

Etio: (1) **Congenital**:
(a) *Pin point meatus*
(b) Any other part
(2) **Inflammatory**: Congestion + spasm
(a) Urethral congestion
(b) Acute urethritis:
. Over a chronic focus (stricture)
(c) *Chronic urethritis:* Infiltration
: *Chronic gonorrhœa*
(3) **Traumatic**:
(a) *False passage*
(b) *Rupture*
(c) Impacted foreign body
(d) *Post operative*.
(α) Prostatectomy
(β) Penisectomy
(e) *Tied-in catheter*
(4) **Ulcerative**:
: Impacted stone or F B.
(5) **New growths**:
: Carcinoma
(6) **Spasmodic**:
(α) Nervous
(β) Inflammatory

Morb anat. (A) *Shape*:
- (*a*) Linear
- (*b*) Annular
- (*c*) Tortuous
- (*d*) Bridle

(B) *Consistency*
- (*a*) Resilient
- (*b*) Indurative
- (*c*) Cartilaginous

(C) *Clinical*
- (*a*) Irritable
- (*b*) Passable } to instruments
- (*c*) Impassable } to instruments
- (*d*) Impermeable to urine

Sites (A) Congenital
External meatus

(B) *Gonorrheal multiple*
- (*a*) *Bulbous urethra*
- (*b*) Peno scrotal junction
- (*c*) Distal end

(C) False passage
- (*a*) *Bulbous urethra*
- (*b*) Prostatic urethra
- (*c*) Distal to stricture

(D) Rupture single
- (*a*) Bulbous urethra
- (*b*) Prostato membranous junction

(E) Post operative at the site of operation
(F) Stone at the site of impaction
(G) Tied in catheter peno scrotal junction

Path (*a*) Congestion
↓ (*b*) Soft infiltration
↓ (*c*) Hard infiltration
↓ (*d*) Fibrosis
↓ (*e*) Stricture

Clinic (1) **Chronic urethritis** syndrome
Urethral discharge

(2) Dysuria **Straining at micturition**
+ (*a*) Back pressure syndrome
or (*b*) Ascending infection syndrome

(3) Palpation of urethral floor

(4) **Sounding:**
- (*a*) Catheter (α) Rubber
  - (β) *Gum elastic*
  - (γ) Metal
- (*b*) Sounds metal
- (*c*) Bougies (α) Gum elastic
  - (β) Filiform

(5) Urine examination
  (a) Ordinary
  (b) After prostatic and urethral massage
(6) Urethrography
(7) Urethroscopy

Compl. (1) *Acute and chronic retention*
(2) *False incontinence*
(3) *Back pressure*
  (a) Proximal hypertrophy
  ↓ (b) Proximal dilatation
  ↓ (c) Proximal functional failure
  ↓ (d) Uræmia
(4) *Ascending infection*
  (a) Urinary cystitis → pyelitis
  (b) Genital epididymo orchitis
(5) **Stone formation:**
  (a) Urethral
  (b) Proximal vesical, renal
(6) **Local sepsis:** Peri urethritis → abscess
(7) **Extravasation** urine
(8) Urinary **fistulæ**
(9) Malignancy
(10) Extra urinary gonorrhœal rheumatism
(11) *Treatment complications*
  (a) Urethral shock
  (b) **Urethral sepsis**
  (c) **Urethral trauma:** False passage
  (d) Urethral haemorrhage
  (e) Extravasation urine
  (f) Anuria
(12) **Strain syndrome:**
  (a) Inguinal hernia
  (b) Hæmorrhoids
  (c) Prolapse rectum

Treatment (A) *Conservative treatment*
Ind Acute congestive retention
Tech (1) Hot hip bath
  (2) Sedatives

(B) *Instrumental treatment Dilatations*
Ind No acute complications
Contra Acute congestive or spastic retention
Anæsth. (a) **Urethral**
  (b) Spinal
  (c) General
Tech (1) **Intermittent:** Weekly
  (2) **Rapid:** Preliminary to (3)

(3) **Continuous:**
Bougies → sounds → catheters
Tied in the urethra
Changed for next numbers

Instr (1) **Gum elastic bougies** · French
(2) **Lister's metal sounds**
(3) **Catheters:** Gum elastic and metal
(4) **Filiform bougies:** Faggot method
(5) **Kollmann's dilators** In later stages

N B Do not anæsthetise the urethra
Compl Rupture urethra → extravasation

Compl (*a*) Urethral shock
(*b*) Urethral fever
(*c*) False passage
(α) Hæmorrhage
(β) Extravasation
(*d*) Ascending sepsis
(*e*) Anuria → uræmia

Preparation (*a*) Urinary antiseptics
(*b*) Diuretics and hydrotherapy

Steps (1) *Large calibre stricture* $>20°$ *charriere*
(A) **Kollmann's dilator technique:**
(*a*) At weekly intervals
(*b*) At a sitting
(α) 2° for under 30 charriere
(β) 1° „ between 30–40 ch
(γ) ½° over 40 charriere
↓ (B) Bladder lavage
(α) Acriflavine 1–8000
(β) Mercury oxycyanide 1–8000

(2) *Small calibre stricture* $<20°$ *charriere*
Treat (1) Preliminary instrumental or operative
↓ (2) Kollmann dilator
Tech (1) **Instrumental dilatation:**
(*a*) **Intermittent** weekly
(1) *Bougie* dilatation
(2) *Steel sound* dilatation
Ind Dense strictures
(3) *Guides* and followers
(α) Urethral lubrication
Olive oil instillation
(β) Faggot method
(γ) Urethroscopic guidance
(*b*) **Continuous** dilatation
Tech *Catheters* of increasing calibre
: Tied in continuously

Compl : (α) Ascending infection
(β) Reflex anuria
(γ) Urethral ulceration :
(1) Stricture
(2) Fistula

↓ (2) Kollmann's dilator technique :
. After calibre > 20° charriere

(C) *Operative treatment* :

Ind . (1) Cases unsuitable for dilatation .
(a) Impassable stricture
(b) Complications :
(α) Urethral :
(1) Irritability
(2) Hæmorrhage
(3) False passage
(4) Extravasation
(5) Recurrent retention
(6) Peri urethral abscess
(7) Urethral fistula
(8) Calculus
(β) Back pressure
(γ) Ascending infection
(c) Secondary stricture :
Growth
(2) Failure of dilatation .
(a) Cartilaginous stricture
(b) Resilient stricture
(c) Recurrent stricture
(d) Multiple strictures
(3) Inability or unwillingness to undergo dilatation treatment

Operations . (1) **Internal urethrotomy** : (See under Operations)
Ind : *Passable uncomplicated* stricture .
. (esp resilient, cartilaginous and multiple)
(2) **External urethrotomy** : (See under Operations)
Ind (a) Passable *complicated* stricture
(b) *Impassable* stricture
Tech : (a) Passable complicated :
: **Syme** : With a guide
: **Fergusson**
(b) Impassable :
(α) **Wheelhouse** : Staff
(β) **Cock** : Blind operation
(γ) **Perineal dissection** :
: Of proximal dilated urethra
(δ) **Retrograde catheter** :
(1) Cystostomic introduction
(2) Perineal exposure

(3) **Suprapubic cystostomy** :

Ind (a) *Preliminary* to stricture operations
(b) *Emergency* measure in
(1) Renal failure
(2) Peri-urethral suppuration
(3) Extravasation urine
(4) Impassable stricture
(5) False passage
(6) Ascending infection

Contraind *Acute on chronic retention*

After treat (a) Retrograde catheterisation
(b) Instrumental dilatation of stricture
(c) Operative treatment of stricture

(4) **Excision of the stricture**

Ind Single indurated, complicated, traumatic stricture less than one inch long

Contra (a) Stricture > one inch
(b) Multiple strictures
(c) Infective strictures

Post compl (1) Anuria with uraemia
(2) Ascending urinary sepsis
(3) *Urinary fistulae*
(4) **Recurrent stricture**

After treat (1) Urinary diluents and antiseptics
(2) **Prolonged intermittent dilatation**

(V) URETHRAL FISTULAE:

Def Abnormal tract conveying and discharging urine

Etio (1) *Congenital*
(a) Epispadias
(b) Hypospadias

(2) *Acquired*
(a) **Traumatic:**
(α) Rupture urethra
(β) False passage
(γ) Catheter slough
(δ) Perineal operations

(b) **Inflammatory** :
(α) Peri urethral abscess
(β) Extravasation of urine

(c) **Obstructive**.
(α) Stricture
(β) Stone impacted
(γ) New growth

(d) ***New growth:***
Carcinoma

(e) **Specific:**
Bilharziasis

Clinic **Sinus discharging urine:**
(a) Smell
(b) Chemical examination
(c) **Chromo diagnosis:**
Injection of methylene blue

Treat (a) **Treatment of etiology:**
(α) Removal of obstruction
(β) Treatment of infection
(γ) Removal of irritation
(b) **Suprapubic cystostomy:**
↓ Perineal dissection
↓ Excision of the fistulous tract
↓ Packing
(c) **Plastic operations**

(VI) NEW GROWTHS OF THE URETHRA:

(A) *Benign*
(1) Papilloma
Etio (a) Simple
(b) Specific Bilharzial
Clinic (1) Chronic urethral discharge
(2) Urethral hæmorrhage
(3) Urinary obstruction
Treat (a) Diathermic excision
(b) Urethroscopic removal
(2) Caruncle
Etio Female urethra
Cause Urethritis
Clinic (a) Painful hæmorrhage
(b) Painful micturition
(c) Painful coitus
(d) Bleeding micturition
(e) Small red, fleshy tumour
At the external meatus
Treat (a) Diathermy excision
(b) Treatment of urethritis
Compl Recurrence
(3) Urethral cysts
Etio (a) Congenital pouch
(b) Blocked Littre's gland
(c) Blocked Cowper's gland
(B) *Malignant* Carcinoma urethra
Etio (1) Trauma
(2) Leukoplakia
(3) Stricture
Site Bulbous urethra

Morb anat Squamous celled
Clinic (a) Pus or blood per urethrum
(b) Urinary obstruction
(c) Urethral
(α) Growth
(β) Stricture } indurated
(γ) Fistula
(d) Profuse bleeding on catheterisation
(e) Urethroscopy
(f) Secondaries
(α) Groin glands
(β) Lungs liver
Compl (1) Hæmorrhage
(2) Stricture → urinary obstruction
(3) Urinary sepsis
(a) Local abscess → fistula
(b) Ascending
(4) Fistulæ
Treat (a) Amputation penis + excision glands
(b) Radium

(VII) URETHRAL OPERATIONS:

Pre-operative measures
(1) Kidney efficiency investigations
(2) Blood and urine urea investigations

Pre-operative treatment
(1) Diuretics and hydrotherapy
(2) Urinary antiseptics

(1) MEATOTOMY
Ind (a) Congenital pin hole meatus
(b) Stricture external meatus
Steps (a) Novocain infiltration of frænum
(b) Enlargement of meatus
By scissors cut
To one side of frænum
(c) Mucous membrane—skin suture
Catgut oo

(2) INTERNAL URETHROTOMY
Def Intra urethral incision of a stricture urethra
By an urethrotome
Ind Passable uncomplicated local traumatic stricture
Anæsth (a) Local urethral
(b) Spinal
(c) General
Prelim Urethral wash
Oper (1) Introduction of filiform guide
↓ (2) Introduction of staff in mid line
↓ (3) Introduction of knife along the staff groove
↓ (4) Stricture cut
(a) Distalo-proximally
or (b) Proximo-distally

↓ (5) Withdrawal of knife staff and guide
↓ (6) Pass in sounds and dilate
↓ (7) Tie in a catheter and wash the bladder
Difficulties (a) Impassable stricture
(b) Retention of guide in the bladder
(c) Failure to pass a metal sound

(3) EXTERNAL URETHROTOMY
Def External incision of stricture urethra by perineal route
Ind (A) Passable complicated stricture
Syme s operation
(B) Impassable stricture
(a) Wheelhouse s operation
(b) Cock s operation
(c) Perineal dissection
(d) Suprapubic retrograde catheter
Tech (A) Syme s operation
Ind Passable stricture with fistulæ
Steps (a) Introduction of Syme s staff
(b) Fixation in mid line
(c) Incision on the staff
(d) Incision of the distal urethra
(e) Incision of the stricture
(f) *Incision of the proximal urethra*
(g) Introduction of Teale's gorget
(h) Pass in a rubber tube & drain urine
(i) Tie in the bladder rubber tube in perineum
After treat (1) Removal of the perineal tube after 4 days
↓ (2) Passage of a steel sound after 7 days
↓ (3) Indwelling catheter for 10 days
↓ (4) Intermittent dilatation
(B) Wheelhouse s operation
Ind (a) Impassable stricture
(b) Removal of calculus or F B
Steps (a) Pass in Wheelhouse staff (or a rubber catheter)
Upto the stricture
(b) Incision of the urethra
½ inch distal to the stricture by a longitudinal or curved transverse incision
(c) Pick up the urethral muc mem
(d) Turn the staff & retract, or use the catheter loop
(e) Search for proximal lumen
(f) Pass in a probe
(g) Incision of the stricture distalo proximally
(h) Pass in a gorget
(i) Guide in a catheter
(α) From ext meatus to perineal wound
↓ (β) From perineal wound to bladder
(j) Suture the perineal wound
With a glove or slit rubber drain

After treat (1) Removal of the catheter after 10 days
(2) Passage of steel sound after 14 days

If Wheelhouse fails

(C) Perineal dissection of proximal urethra

(D) Cock's operation

Def External urethrotomy without a guide

Ind (a) Multiple fistulæ
(b) Acute retention
(c) Extravasation of urine
(d) Failure of Wheelhouse

Steps (a) Lithotomy median position
(b) Rectal finger at prostate tip
(c) Stab at perineal central point
(d) Open the dilated prostatic urethra
(e) Pass in Teale's gorget
(f) Pass in a catheter
(g) Cut the stricture proximo-distally
(i) Tie in the catheter in perineum

(E) Suprapubic retrograde catheter
↓ Perineal exposure

(4) EXCISION OF URETHRAL STRICTURE

Ind Hard indurated tubular stricture less than 1"

Contra (a) Stricture > 1"
(b) Multiple strictures

Steps (a) Preliminary suprapubic cystostomy
14 days before
(b) Retrograde sound
(c) Incision of bulbocavernosus
Exposure of bulbous urethra
(d) Excision of stricture and indurated tissues
Not more than 1.5"
(e) Suture of the urethra over a bougie esp the roof
(α) Change of lithotomy into straight posture
(β) Mobilisation of corpus spongiosum
(f) Perineal drain

Post-operative treatment after urethral operations

(A) *Local*
(1) Removal of the perineal or meatal catheter
10th day
↓ (2) Passage of a sound
14th day
↓ (3) *Intermittent urethral dilatation Weekly*
(4) Bladder washes B D
First three days
(5) Hot permanganate hip baths
After four days

(B) *General*
(1) Diuretics and hydrotherapy
(2) Urinary antiseptics

Post-operative complications
(1) Urethral shock
(2) Urethral fever
(3) Urethral hæmorrhage
(4) Urinary obstruction retention
(5) Local sepsis
(a) Peri urethral abscess
↓ (b) Extravasation
↓ (c) Fistulæ
(6) Ascending sepsis
(a) Urinary pyelitis
(b) Genital epididymo-orchitis
(c) General septicæmia
(7) Renal fa lure
(8) Recurrence of stricture
(9) Delirium nervosum

(VIII) IMPORTANT POINTS

(1) External urinary meatus is the narrowest part of male urethra and normally admits 25 30 Charriere
(2) Hypospadias glandis is the most common variety of hypospadias complete epispadias is the most common variety of epispadias, and is accompanied by ectopia vesicæ and rudimentary development of external genitalia.
(3) Sequelæ of complete intrapelvic rupture of urethra
(a) Impermeable stricture
(b) Suprapubic fistula
(4) Plastic operations for hypospadias
(a) Bucknall
Floor formed by anterior scrotal skin
(b) Winsbury White
Floor formed by mucous aspect of transplanted fore-skin
(5) *Never pass fine pointed and slender metal catheters or sounds in the urethra*
(6) *The first principle in treatment of all intrapelvic and the majority of extrapelvic ruptures is the immediate performance of supra pubic cystostomy under full anæsthesia,* to divert urinary stream and/or check further extravasation.
(7) *The sutureless operation is without doubt the operation of choice when extravasation has occurred,* for suturing is technically impossible in the presence of infection or extravasation
(8) Etiology of rupture urethra
(a) Anterior falls astride perineum
(b) Posterior fracture pelvis
(9) *Catheterise on suspicion of urethral rupture*
(a) Incomplete rupture
• Catheter passes on with some difficulty

(b) Complete rupture:
Catheterisation impossible

(10) *Under no circumstances should the patient attempt to micturate if urethral rupture is suspected.*

(11) *In complete rupture of urethra, unless intrapelvic, no catheter is tied in the urethra after its exposure and suture, as it predisposes to traumatic stricture*

(12) *Every rupture or false passage of the urethra, even the slightest, is a potential stricture*

(13) Bulbous urethral rupture syndrome:
(a) Urethral independent hæmorrhage
(b) Perineal hæmatoma
(c) Retention of urine
(d) Pain

(14) *Promiscuous catheterisation with only ordinary precautions must be abolished*

(15) *Extrapelvic rupture should have no indwelling catheter, which is necessary in intrapelvic rupture*

(16) Whilst the gap between the ends of the urethra may be considerable when the patient is in lithotomy position, yet when the legs are extended, probably the urethral ends will be in contact

(17) *Investigations in a suspected case of rupture urethra should always be done in operation theatre*

(18) *Immediate treatment of intrapelvic rupture of urethra:*
(a) *Suprapubic cystostomy*
+ (b) *Retzius drain*
+ (c) *Correction of backward displacement of bladder neck:*
By Indwelling antegrade catheter guided by retrograde one

(19) If the bladder is even moderately distended, the lesion must be situated at or below the vesical sphincter.

(20) *Principal indication for an indwelling catheter in urethral injuries is intrapelvic urethral rupture*

(21) *Membranous urethra, unlike the bulbous, shows very little tendency to stricture formation*

(22) *Common complications of catheterisation or instrumentation:*
(1) *Urethral fever*
(2) *False passage*
(a) Hæmorrhage
(b) Extravasation
(c) Stricture
(3) *Ascending infection*
(a) Cystitis → pyelitis
(b) Orchitis

(23) Harry Bank's two metal catheters method of guiding a catheter past intrapelvic complete rupture of urethra and then drawing out a self retaining catheter through suprapubic opening

(24) In every case of rupture bladder where peritoneal soiling is suspected, open the peritoneum first and explore the pelvis.

(25) *Two great indications in the treatment of urinary extravasation are*:

(a) *To mitigate blood infection*
(α) *Multiple incisions*
(β) *Hydrogen peroxide or permanganate dressings*

(b) *To combat uræmia*
(α) *Bladder drainage*
(β) *Sod sulphate drip with saline*

(26) In cases of dense traumatic stricture following rupture of bulbous urethra, complete excision of the stricture is often the best treatment

(27) *In cases of acute retention* due to stricture of the urethra, a fine gum elastic filiform bougie can often be passed, if necessary by *faggot method*, and urine trickles down by its side.

(28) Traumatic rupture of the urethra constitutes about 20% of all urethral strictures

(29) Urethral stricture is most common among males between 25 and 45, and is usually the result of chronic gonorrhœal urethritis

(30) *Gonorrhœal urethritis → soft infiltrations → hard infiltrations → fibrosis → strictures*

(31) Complete rupture of the intrapelvic urethra, unless treated skilfully soon after the accident, leads to one of the most hopeless forms of urethral stricture

(32) *Anæsthesia of the urethra*

Ind Catheterisation in acute retention

Tech (1) 5% cocaine or 2% *novocain*
Drachms 2 injected by *10* c cs. syringe
(2) Clamp the meatus
For 5 minutes

(33) Most resistant strictures are those of external meatus due to healed chancre.

(34) Etiology of external meatal stricture
(a) Congenital
(b) Phimosis
(c) Gonorrhœa
(d) Chancre
(e) Bad circumcision.

(35) *Gonorrhœal strictures are usually multiple (75%); majority (60%) being situated in the bulb, while remainder are in penile portion. Prostatic and membranous portions are never affected*

(36) Differential diagnosis between:
  (A) Bladder neck obstruction.
    (*a*) Delay in start
    (*b*) Loss of projection: dribbling
    (*c*) Ineffectual straining
  (B) Stricture urethra:
    (*a*) Small stream
    (*b*) Good projection
    (*c*) Effectual straining

(37) *Easiest method of dilating a small bore stricture is to insert a filiform gum elastic guide*

(38) Kollmann's dilator
  (*a*) Closed 20° Charriere
  (*b*) Fully open 45° Charriere at bulb

(39) Stage of dilatation between 35° and 38° is difficult and should be regarded as critical

(40) When full dilatation has been reached on three consecutive occasions without any resistance before 40° Charriere and with no bleeding, the intervals are gradually extended upto one year

(41) Sterilisation of bougies is best done by hanging them in *closed jars containing calcium chloride* and *formalin tablets* for 12 hours.

(42) Operation for stricture urethra should only be performed as a last resort after the failure of repeated instrumental methods

(43) Passage of a guide through a stricture is much easier when attempted from the proximal side.

(44) *Gonorrhœa leads to retention of urine from four causes:*
  (*a*) *Spasmodic + congestive stricture*
  (*b*) *Acute prostatitis*
  (*c*) *Peri urethral abscess*
  (*d*) *Stricture urethra*

(45) *Complications of urethral obstruction.*
  (*a*) *Urinary back pressure.*
    (α) Hypertrophy → dilatation
    (β) Functional failure → uræmia
  (*b*) *Sepsis:*
    (α) Local
    (β) Ascending genito urinary
  (*c*) *Lithiasis:*
    (α) Local
    (β) Proximal

(d) *Fistulæ*
(e) *Strain syndrome*
(f) *Treatment complications:*
  (1) Shock
  (2) *False passage*
  (3) Hæmorrhage
  (4) Extravasation
  (5) *Sepsis*
  (6) Anuria

(46) Before the introduction of a follower or internal urethrotomy staff, test their union with the guide; otherwise the guide will be left in the bladder on withdrawal of the instrument.

(47) *In suture of the urethra, suture only the superior wall;* leave the lateral walls and the floor unsutured. *Do not tie in a catheter Drain suprapubically or perineally.*

(48) *Most common injuries to urethra.*
(a) *Faulty catheterisation*
(b) *Falls or kicks on perineum*
(c) *Fracture pelvis*

(49) *Most common complications of rupture urethra:*
(a) *Acute retention*
(b) *Extravasation*
(c) *Stricture*

(50) *Exclude rupture urethra in every case of fracture pelvis.*

(51) *Most common causes of urethral stricture.*
(a) *Gonorrhœal*
(b) *Traumatic*

(52) Common sites for stricture:
(a) External meatus
(b) Peno scrotal junction
(c) Bulb
(d) Prostato membranous junction

(53) Intermittent dilatation for at least two years is necessary in stricture urethra, recurrence being very common

(54) Fistulæ are less common after internal urethrotomy.

(55) *Fistulæ are common after tying in metal catheters, the complications of which are:*
(a) *Acute urethritis*
(b) *Peri urethral abscess*
(c) *Fistulæ. peno scrotal*
(d) *Ascending sepsis*
(e) *Anuria → uræmia*

(56) Most common causes of peri urethral abscess:
(a) Chronic gonorrhœa
(b) Impacted stone
(c) Indwelling catheter.

(57) Extravasation of urine

Path (A) Deep or intrapelvic or subsymphysis
(B) Superficial or extrapelvic or suprasymphysis

Etio (A) Traumatic rupture
(B) Septic peri urethral abscess.

(58) *Most common causes of urethral fistulæ*
- *(a) Stricture*
- *(b) Peri urethral abscess*
- *(c) Impacted stone*
- *(d) Indwelling catheter*
- *(e) Bilharziasis*
- *(f) Carcinoma*

(59) Multiple urinary fistulæ
- (a) Extravasation urine
- (b) Carcinoma
- (c) Tuberculosis
- (d) Bilharziasis

(60) Late hæmorrhage after internal urethrotomy should be treated by
- (a) Suprapubic cystostomy
- + (b) Perineal section
  Pack with snake venom gauze
- + (c) Blood transfusion

CHAPTER VI

THE PROSTATE

(I) INFLAMMATIONS OF THE PROSTATE:

(A) *Acute inflammations:*

(1) ACUTE PROSTATITIS:

Etio: (a) **Acute urethritis:**
- (α) Gonorrhœal
- (β) B. coli
- (γ) Instrumentation

(b) Descending infection: pyelitis

Clinic: (a) **General** signs of sepsis:
: Septic toxæmia

(b) **Local** signs of inflammation:
: Perineal heaviness and tenderness

(c) **Reflex** signs of inflammation:
- (α) Acute retention of urine
- (β) Proctitis

(d) **Rectal examination:**
: Painful, tender, indurated mass

Diff. diag: (a) Cystitis
(b) Vesiculitis
(c) Posterior urethritis

Compl: (1) **Acute retention of urine**
(2) **Extension** to vesicles and testes
(3) Prostatic **abscess**
(4) **Chronic prostatitis**

Treat: (a) **Avoid all urethral instrumentation**

(b) **Fomentations:**
- (α) Hot bag to the perineum
- (β) Hot enema:
  : With morphine suppository
- (γ) Hot bag per rectum.
  : Elliolt treatment:
  : (Med Ann 1939)
- (δ) **Hot hip baths**

(c) **Urinary treatment:**
- (α) Diuretics
- (β) Antispasmodics: Tr. hyoscyamus
- (γ) Antiseptics

(d) General treatment of sepsis:
: **Sulphonamides**

(2) ACUTE PROSTATIC ABSCESS

Etio (a) Acute **gonococcal** prostatitis
(b) Secondary urethral prostatitis

Clinic (1) All signs of acute prostatitis.
Persisting for **more than one week**
(2) Pronounced septic toxaemia
(3) P R Tender **fluctuation**

Compl (1) Bursting into (a) Rectum
(b) Urethra
↓ (2) Recto urethral fistula

Treat (a) Conservative (See above)
↓ (b) Drainage
(α) Urethral passage of a catheter
(β) Perineal
(1) Exaggerated lithotomy position
(2) Incision 1" in front of anus
+ ½" lateral to midline
(3) Hilton s evacuation
(4) Breaking the septa
(5) Drainage tube

(B) *Chronic inflammations*

(1) CHRONIC PROSTATITIS

Etio (A) Primary (a) Insidious
(b) **Acute prostatitis**
(B) Secondary (a) Chronic **urethritis**
(b) **Genital** sepsis
(α) Vesicles
(β) Testes

Bact (a) Colon bacillus
(b) Staphylococcus
(c) **Gonococcus**

Clinic (1) Pain local or referred
: **Prostate backache**
(2) Perineal tenderness
(3) **Urinary syndrome**: Obstruction
(4) Genital syndrome emissions
(5) Metastatic syndrome
Synovitis, fibrositis

Signs (1) Urethral discharge
(2) Prostatic massage
Threads and commas
(3) Epididymo orchitis
(4) Urine examination
(5) Urethroscopy

Treat: (A) **Urethral**: Twice weekly
(*a*) Urethral **dilatation**
↓ (*b*) Seminal vesicular, prostatic and urethral **massage** over a sound:
: From above downwards
↓ (*c*) Urethral **irrigations**:
(α) Acriflavine: 1–8000
(β) Mercury oxycyanide. 1–8000
(B) **Rectal**: Diathermy
(C) **Vesical lavage**:
(*a*) Urethroscopic catheterisation:
: Of ejaculatory ducts
(*b*) Vasotomy: intra luminar injection of 5–10 c cs of 1% mercurochrome
(D) **Prostatic injections**:
(*a*) Intra prostatic injection:
: Of 5–10 c cs. of 1% mercurochrome
↓ (*b*) Prostatic massage
(E) **General**:
(*a*) Vaccine therapy
(*b*) Sulphonamide group
(*c*) Nervine tonics

(2) CHRONIC GONOCOCCAL PROSTATITIS:
Etio: Gleet
Clinic: (As under (1) above) + urethral smear
Compl: (1) Spread to genitals.
: Vesicles and testes
(2) Myositis, fibrositis and arthritis:
: Gonorrhœal rheumatism
(3) Neurasthenia
Treat: (1) **Prostatic evacuation**:
Tech (*a*) Allow retention of urine
↓ (*b*) Pass a urethral sound
↓ (*c*) Rectal massage
. *Of prostate and vesicles*
↓ (*d*) Urethral massage
From above downwards
↓ (*e*) Removal of the sound
↓ (*f*) Evacuation of bladder
(2) Gonococcal vaccines
(3) Nervine tonics

(3) CHRONIC TUBERCULOUS PROSTATITIS:
Etio: Young adults
Predisp: Gonococcal prostatitis

Path (a) Primary
(b) Secondary to
(α) Vesiculæ seminalis
(β) Epididymis
(γ) Kidney

Site Near about ejaculatory ducts

Clinic (1) Frequency of micturition in young adults
(2) Acid pyuria
(3) P R
Enlarged tender, nodular prostate
(4) Beaded vas deferens
(5) Tender nodules in epididymis

Compl Spread to (a) Genital tract
(b) Urinary tract

Treat (1) Conservative anti tuberculous
(2) If tuberculous abscess
Evacuation + curettage + B I P P
(3) Excision
If focus is primary and early

(4) CHRONIC PROSTATIC ABSCESS

Etio Tuberculosis of prostate

Clinic (a) Signs of chronic tuberculous prostatitis
↓ (b) Fluctuation per rectum

Compl Bursting (a) External sinus
(b) Recto urethral fistula

Treat Evacuation + curettage + B I P P

(5) PROSTATIC CALCULI

Etio Gonorrhœal prostatitis

Sites (A) Exogenous prostatic urethra
(B) Endogenous prostatic tissue
(a) Associated with hypertrophy
(b) Un associated with hypertrophy

Structure Phosphate oxalate carbonate of calcium

Clinic (a) Signs of stricture urethra
or (b) Signs of enlarged prostate
or (c) Signs of cystitis
(d) P R hard, grating nodules
(e) Sounding metalic click
(f) X Rays retro-symphysial opacities
(g) Urethroscopy

Compl (1) Acute retention of urine
(2) Urethral stricture → back pressure
(3) Cystitis
(4) Enlarged prostate
(5) Prostatic abscess

Treat: (A) Instrumental removal:
Ind: Prostatic urethral calculus
Tech: Urethroscopic removal
(B) Displacement + suprapubic removal:
Ind: Prostatic urethral calculus
(C) Perineal removal
(D) Prostatectomy.
Tech: (a) Suprapubic
(b) Perineal
Ind: Multiple stones in prostatic tissue

(II) PROSTATISM:

Def: Interference with emptying of the bladder due to:
(a) Prostatic enlargement
or (b) Prostatic fibrosis

Path: (A) **Hypertrophic prostatism:** *Hypertrophic prostate*
(a) *Simple hypertrophy:*
Syn. Chronic lobular prostatitis
Cause: Hormonic (testicular) hyperplasia
Path. Fibro epithelial degeneration
Site: Mid lobe hypertrophy
Morb. anat: Collar around internal meatus
(b) *Innocent growths:*
Syn: Fibro myo adenomata
Morb. anat: Symmetrical or asymmetrical enlargement:
. Of a part of or whole of the prostate
(c) *Malignant growths:*
Syn: Carcinoma or sarcoma prostate
Morb. anat: (a) Irregular rapid enlargement
(b) Infiltration of surroundings
(d) *Chronic inflammatory hyperplasia;*
Syn: Chronic gonorrhœal prostatitis
Cause: Gleet
Morb. anat: Chronic inflammatory hyperplasia

(B) **Atrophic prostatism:** *Fibrotic prostate*
Syn: Interstitial fibrotic prostatitis
Path: (a) Fibrous hyperplasia
+ (b) Glandular atrophy
Morb. anat: (a) Fibrous transverse bar:
: At the internal meatus
(b) Small, hard prostate
(c) Fibrosis of internal sphincter:
: Rigid,

(C) **Extra-prostatic**

Path: *Hyperplasia of posterior urethral glands*
Morb. anat: Small, soft, spherical projection:
: Near the internal meatus

Etio: (1) *Theories:*
- (a) **Neoplastic:**
  - (α) Fibro myo adenoma
  - (β) Carcinoma
- (b) **Hormonic:** Œstrogenic
- (c) **Inflammatory:** Chronic inflammation
- (d) **Degenerative:**
  : Glandular atrophy + interstitial hypertrophy

(2) *Sites:*
- (a) Middle lobe
- (b) Lateral lobes
- (c) Posterior lobe
- (d) Anterior lobe

Clinic: (1) **Urinary obstruction type:**
In a man over 50
- (a) Difficulty . at the start
- (b) Frequency by night
- (c) Dribbling . at the end of micturition
- (d) Chronic retention:
  - (α) Partial residual urine
  - (β) Complete

(2) **Uræmic type:**
: Acute or chronic uræmia

(3) **Sexual type:**
. Senile sexual irritation

(4) **Complication type:**
- (a) Acute retention of urine
- (b) Hæmaturia
- (c) Cystitis and ascending infection
- (d) Urinary calculus

Signs (1) **P. R.:**
- (a) Positive . (α) Hypertrophic
  (β) New growth
- (b) *Negative* (α) *Middle lobe*
  (β) Fibrous prostate
- (c) Prostatic massage

(2) **Catheterisation.**
- (a) Obstruction
- (b) Residual urine

(3) **Cystoscopy:**
- (a) Prostate: (α) Shape of bladder neck
  (β) Shape of the lobes
- (b) Bladder: (1) Retro prostatic pouch
  (2) Hypertrophy or dilatation
  (3) Diverticulæ

(5) Cystitis
(6) Stone
(7) Growths
(c) Kidneys: renal efficiency
(4) **Cystography:** (Injection of 15% Sodium Iodide in the bladder & X-Ray)

Compl: (1) **Abnormal micturition:**
(a) Retention. (α) Acute
(β) Chronic
(γ) Recurrent
(b) Incontinence: false
(2) **Abnormal urine:**
(a) Hæmaturia:
: Varicose peri prostatic veins
(b) Pyuria:
: Cystitis, pyelitis
(3) **Urethral obstruction**
(4) **Bladder:**
(a) Hypertrophy → dilatation → overflow
(b) Post-prostatic pouch: residual urine
(c) Diverticulæ
(d) Infection
(e) Calculus. in post-prostatic pouch
(5) **Ureters and kidneys:**
(a) Dilatation → inefficiency → uræmia
(b) Ascending infection
(6) **Genital system:**
: Sexual irritation
(7) **General system:**
(a) Arteriosclerosis
(b) Hyperpiesia
(c) Heart affections
(d) Uræmia
(8) **Strain syndrome:**
(a) Hernia. bilateral direct inguinal
(b) Prolapse rectum
(c) Hæmorrhoids

Treatment: (1) *Conservative:*
(A) **Hormonic:** Testosterone
(B) Operative:
(a) **Steinach II:** Vasectomy
(b) Voronoff: testicular graft
(C) Catheter life: palliative
(a) Intermittent urethral
(b) Continuous suprapubic

(2) *Radical prostatectomy:*

(A) **Suprapubic prostatectomy:**

(a) *One stage:*

Pre oper (α) Catheter drain
(β) No catheter drain

Tech: (a) Harris: prostatic bed reconstruct.
(b) Thomson Walker: open
(c) Freyer: closed

Ind. (a) No urinary complications
(b) Good general health

(b) *Two stage:*

Tech (α) Suprapubic cystostomy
↓ (β) Prostatectomy:
(1) Freyer: closed
(2) Thomson Walker: open
(3) Harris: modified open
: Retrigonisation
(4) Ainsworth Davis:
: Diathermic resection
(5) Irwin:
(a) Diathermic resection
\+ (b) Division of int. sphincter

(c) *Three-stage:*

Tech: (α) **Catheter drain + vasectomy:**
: Gradual decompression
↓ (β) **Suprapubic cystostomy:**
: Upto renal recovery
↓ (γ) **Prostatectomy:**

Ind Chronic urinary retention

(B) **Perineal prostatectomy:** One or two stage
(a) Young
(b) Winsbury White

(C) **Trans-urethral prostatic resection:**

Syn: McCarthy

Ind: (a) Prostatic fibrosis
(b) Median lobe enlargement
(c) Median bar obstruction

Indications for prostatectomy:

(1) **Urinary irritation:** Frequency

(2) **Urinary obstruction:**
(a) Residual urine > 2 ounces
(b) Recurrent acute retention
(c) *Difficult catheterisation*
(d) False incontinence
(e) Back pressure signs

(3) **Ascending urinary sepsis:**
   (*a*) Cystitis
   (*b*) Pyelitis, pyelonephritis
(4) **Ascending genital sepsis:**
   . Recurrent epididymo orchitis
(5) Recurrent **stone** formation
(6) Recurrent **hæmaturia**
+ (7) *No contra indications* (See below)

Contra indications for prostatectomy

(A) *Temporary*.
   (1) Pronounced **back pressure**
   (2) Pronounced **ascending sepsis**
   (3) Mild **circulatory** complications
   (4) Mild **pulmonary** complications
   (5) Mild **gastro-intestinal** complications
   (6) Temporary deterioration of **general health**
   (7) Absence of preliminary investigations
   (8) Absence of pre operative preparation

(B) *Permanent*.
   (1) Inoperable carcinoma
   (2) General debility or cachexia
   (3) Incurable or dangerous disease:
      Heart, blood pressure, liver
   (4) Failure of pre operative treatment

Indications for one stage operation.

: **Early case** of enlarged prostate with **moderate residual urine** but **no complications** (especially infection) and with **nice reaction to preliminary treatment**

Indications for two stage operation:

(*a*) **Back pressure:**
   (α) Urinary renal failure
   (β) Circulatory
      (1) Uræmia
      (2) Enlarged heart and hyperpiesia
(*b*) **Ascending infection**
(*c*) **Failure of non-operative preliminary treat.**
(*d*) **Acute complications:** Acute retention

Advantages of two stage operation:

(*a*) Less shock and hæmorrhage
(*b*) Recovery from urinary & circulatory back pressure
(*c*) Recovery from ascending sepsis

Disadvantages of two stage operation:

(*a*) Two operations
(*b*) More fibrosis
(*c*) Post operative scar hernia

Preliminary investigations:

(1) **Urinary examination:**
- (*a*) Physical
- (*b*) Chemical
- (*c*) Microscopical
- (*d*) Cultural

(2) **Prostate examination:**
- (*a*) P. R.
- (*b*) Bimanual
- (*c*) Cystoscopic

(3) **Bladder examination:**
- (*a*) Catheter: (α) **Residual urine**
  - (β) Bladder capacity
- (*b*) Cystoscopy: condition of the bladder

(4) **Kidney examination:**
- (*a*) Ascending sepsis
- (*b*) ***Efficiency tests***

(5) **Circulatory system:**
- (*a*) Heart
- (*b*) Arteries: arteriosclerosis
- (*c*) Blood pressure

(6) **Blood examination:**
- (*a*) Coagulation time
- (*b*) Bleeding time
- (*c*) Hæmoglobin
- (*d*) Urea content

(7) **Pulmonary system:**
Chronic bronchitis, bronchiectasis

(8) **Gastro-intestinal system:**
- (*a*) Constipation
- (*b*) Tympanitis

(9) **Nervous system:**
- (*a*) Stability
- (*b*) Paralysis

(10) **Metabolic examination:**
- (*a*) Diabetes
- (*b*) Uræmia
- (*c*) Thyroid

Preliminary treatment of enlarged prostate:

(1) *Urinary:*
- (*a*) *Sepsis:*
  - (α) **Urinary antiseptics and diuretics**
  - (β) **Urinary drainage:**
    - (1) Urethral
    - (2) Suprapubic
  - (γ) Bladder **lavage**

(b) *Obstruction → back pressure:*
(α) Urinary **drainage:**
(1) Urethral
(2) Suprapubic
(β) **Diuretics** and **hydrotherapy**
(2) *Blood:*
(a) **Coagulation** treatment
(b) Intravenous **glucose**, soda bi carb
(3) *Uræmia:*
(a) **Urinary drainage:**
(α) Urethral
(β) Suprapubic
(b) **Intravenous sodium sulphate**
(c) **Hydrotherapy** and diuretics
(4) *Circulatory*
(a) Hæmatinics
(b) **Course of digitalis**
(5) *Respiratory*
(a) Curative if complications are present
(b) **Prophylactic: antipneumonic**
(α) Deep breathing
(β) Anti catarrhal vaccine
(γ) Camphor in oil
(6) *Gastro intestinal:*
(a) **Antiseptics:** Carbon, salol
(b) Bowel washes
(c) **Laxatives**
(7) *Metabolic*
Ductless glandular therapy:
(a) Testosterone
(b) Thyroid extract
(8) *Nervous system:*
(a) Sedatives
(b) Nervine tonics
(9) *General sepsis*
: Sulphonamides
(10) *Preliminary operative procedures:*
(a) **Urinary drainage:**
(α) Suprapubic indwelling catheter
(β) Suprapubic cystostomy
(b) **Vasectomy:**
(α) Steinach I
(β) Steinach II
(c) **Testicular graft:** Voronoff

Preliminary urinary drainage methods:

(a) Indwelling **urethral** catheter
(b) **Suprapubic:**
- (α) Puncture with **indwelling de Pezzer**
  Ind Acute back pressure
- (β) **Cystostomy:**
  Ind. (1) Moderate back pressure
  + (2) Urinary sepsis

(c) **Urethral + suprapubic:**
Ind. (α) Pronounced cystitis
(β) Vesical hæmorrhage

Anæsthesia (1) Chloroform ether
(2) Spinal
(3) **Intravenous evipan**
(4) **Local**

Treat· (1) One stage prostatectomy
(2) **Multi-staged prostatectomy:**

(A) **Catheter drain + vasoligature:**
- (a) Gradual catheter decompression
  For 10 days
- (b) Bladder lavages B D
  Pot permang 1 in 8000
- (c) Bladder instillations
  4 ounces of silver nitrate 1 in 4000
- (d) Urinary antiseptics & diuretics

↓ (B) **Suprapubic cystostomy:**
- (a) Renal function tests
  - (α) 12th day
  - ↓ (β) Weekly intervals
- (b) Condition of urinary sepsis

↓ (C) **Prostatectomy:**

Ind (a) **Normal renal functions:**
- (α) Blood urea not more than 50
- (β) Urea concentration 2%

(b) **Urinary sepsis under control**

Steps (1) Pre operative technique
- (a) 20 c.cs. coagulen ciba
- (b) Removal of suprapubic tube
- (c) Preparation of operative field
- (d) Plugging of bladder cavity
  Through suprapubic opening

(2) Excision of suprapubic scar and tract
(3) Midline widening of suprapubic incision
(4) Prostate pushed up by rectal finger
(5) Blunt dissection & removal of prostate·
. Between false and true capsule
(6) Midline splitting of post commissure.
: Between bladder and prostatic cavity

(7) Suture around suprapubic tube of
(a) Anterior bladder wall
(b) Anterior rectus sheath
(c) Skin
After treat (a) Skin protection
Equal parts of zinc & castor oil
(b) Suprapubic drainage
(α) Box
(β) Bottle

Different techniques of prostatectomy

(A) *Suprapubic prostatectomy*

(1) *Freyer*

Syn **Closed prostatectomy**
Tech (a) Small incision
(b) Blind enucleation
Disadv (a) Fat or rigid abdominal wall
(b) Unchecked hæmorrhage
(c) Frequent sepsis
(d) Post operative valve obstruction

(2) *Thomson Walker*

Syn **Open prostatectomy**
Tech (a) Bladder lavage and distension
(b) Suprapubic midline cystotomy
Incision (α) Vertical midline
(β) Transverse
(1) 1" above symphysis
For one stage
(2) 2" above symphysis
For two stage
(c) Inspection of bladder cavity
(d) Digital enucleation of prostate
Bimanual intra urethral
Break through the muc mem imme diately lateral to the verumontanum
(e) Introduction of automatic retractor
(f) Inspection of prostatic bed
(g) Treatment of
(α) Hæmorrhage
(1) Catch and tie
(2) Iodoform plug
(β) Tags excise
(h) Stitching postero lateral vesico prostatic margins
(i) Drainage tube in
(α) Bladder
(β) Retzius
(γ) Urethra (catheter)
(j) Closure of the wound

(3) *Harris:*
Syn: (a) **Open prostatectomy**
+ (b) **Urethral reconstruction**
Tech: (a) Thomson-Walker open prostatectomy
(b) Re trigonisation.
· Approximation of the trigonal apex to the upper end of torn prostatic urethra
: Suture from behind the ureteric bar to the floor of the prostatic cavity with a special needle
(c) Insertion of rubber catheter No. 12:
. Transversely cut tip
: Lateral eye 1.5" from the tip
(d) Obliteration of prostatic cavity
(e) Reformation of urethral side walls:
: Sutures transversely from side to side of prostatic bed, lying above and in front of indwelling catheter
(f) Three looped suture:
(α) Valvular closure of the bladder
(β) Obliteration of Retzius
(γ) Closure of lower angle of incision
(g) Closure of abdominal wall
Adv.. (a) Control of hæmorrhage
(b) Covering of all raw surfaces
(c) Obliteration of prostatic bed
(d) Reformation of prostatic urethra
(e) No stricture or tags

After-treatment of suprapubic prostatectomy:
(1) **Continuation of general preliminary treat.:**
(a) Hydrotherapy + glucotherapy
(b) Diuretics
(c) Urinary antiseptics
(2) **Local treatment:**
(a) Catheter drain: for 10 days
: Closed sterile bottle drainage
(b) Bladder lavage: B. D.
: Silver nitrate 1 in 3000 + soda citras 4%
(c) Removal of drainage tubes:
(α) Retzius. 3rd day
(β) Bladder: 6th day
(γ) Catheter: 10th day
(d) Measurement of urine per 24 hours
(3) **Treatment of complications**

Complications of suprapubic prostatectomy:
(1) **Shock:**

Treat Anti shock treatment, transfusion

(2) Hæmorrhage:

Path (a) Primary wrong plane of cleavage
(b) Reactionary
(c) Secondary

Treat (a) General (α) Morphia
(β) Coagulants
(γ) Intramuscular whole blood
(δ) Blood transfusion

\+ (b) Local
(α) Irrigations Silver nitrate 1 in 8000
Hot saline 110° F
(β) Instillations Tr ferri perchlor
Adrenaline
(γ) Packs Iodoform gauze for 72 hours

↓ (c) Operative

Tech (1) Re open under spinal
(2) Bladder irrigations at 110° F
(3) Inspection of prostatic bed
(4) Removal of clots
(5) Pack with
(α) Hydrogen peroxide gauze
or (β) Pilcher bag
(6) Bladder wash
(7) Closure with
(α) Cystostomy tube
(β) Retzius tube

After treat (a) Continuous drip saline + coramine
or (b) Continuous drip blood transfusion
(c) Leave in Pilcher bag for 72 hours
With 3 ounces weight extension

(3) Pain:

Treat (a) Morphia, hyoscine
(b) Sedative enema
Aspirin 15 grains
\+ Ammon brom. 30 grains
\+ Water 2 ounces

(4) Uræmia:

Path (a) Acute immediate anuria
(b) Chronic at the end of 3-4 weeks

Treat (a) Hydrotherapy via all routes
(b) Diuretics
(α) Intravenous drip sod sulphate
(β) Thorium sod acetate

(5) Ascending sepsis:

Factors (a) Pre-operative sepsis
(b) Retained catheter
(c) Stagnation in prostatic bed

(d) Detached tags
(e) Blood clots
Treat. (a) Urinary antiseptics
(b) Diuretics and hydrotherapy
(c) Urinary drainage
(d) Bladder irrigations

(6) Pulmonary complications:
Path (a) Bronchitis
(b) Pneumonia
(c) Collapse
(d) Œdema
(e) Infarction
(f) Embolism
Treat (a) Deep inhalations
(b) Turpentine stupes
(c) Camphor in oil
(d) Early mobilisation of patient

(7) Gastro intestinal complications:
Path (a) Primary
(b) Secondary to uræmia
Treat (a) Intestinal antiseptics
(b) Laxatives
(c) Acetyl-choline
(d) Rectal tube—enemata stupes

(8) Epididymitis:
Path Ascending infection via vas deferens
Treat (a) Rest + support + counter-irritants
(b) Urethral rest
(c) Preventive bilateral vasectomy

(9) Heart failure

(10) Thrombosis and embolism:
Etio (a) Arteriosclerosis
(b) Hyperpiesia
(c) Circulatory debility
(d) Stasis
Path (1) *Pulmonary*
(a) Instantaneous death
(b) Acute pulmo-cardiac crisis
(c) Infarction pneumonia
(2) Cerebral apoplexy

(11) Delirium:
Types (a) Nervosum
(b) Tremens
Treat (a) Laxatives
(b) Sedatives
(c) Allowance of wine

(12) Wound infection:
Path (a) Urine irritation

(b) Suppuration
(c) Sloughing
(d) Gangrene

Treat Skin protection zinc and oil

(13) **Pelvic cellulitis**:
Etio Tearing of fibrous sheath
Treat (a) Retzius drain
(b) Sulphonamides

(14) **Acidosis**:
Treat Glucose soda bi-carb

Sequelæ of suprapubic prostatectomy

(1) **Unhealing suprapubic fistula**:
Etio (a) Fibrosis
(b) Adhesion to bone
(c) Sepsis
(d) Urethral obstruction Tags stricture
(e) Calculus
Treat (a) Treat the cause
(b) Tie in an urethral catheter for 10 days

(2) **Recurrent urinary obstruction**:
Etio (a) Tag flap
(b) Stricture
(c) Recurrence of prostatism
Treat Treat the etiology
(a) Intra urethral removal of tags
(b) Kollmann's dilator
(c) Tying in a catheter

(3) **Sterility** In all cases

(4) **Calculus**
Treat (a) Keep the urine acid
(b) Removal through suprapubic fistula

(B) *Perineal prostatectomy*
(1) *Young's technique*
With special retractor
(2) *Winsbury-White* Two stage
Tech (a) Exaggerated lithotomy position
(b) Passage of prostatic tractor
Per urethrum
(c) Direct the perineum towards ceiling
(d) Perineal horse-shoe incision
3 cms in front of anal margin
↓ Midway between (α) anus
& (β) ischial tuber
on either side
(e) Division of central perineal point
(f) Cleavage between
(α) Transversus perinealis
& (β) Rectum

(g) Put in a rectal guide
(h) Transverse division of recto-urethralis
(i) Division of Denonvilliers fascia
(j) Exposure of prostatic capsule
(k) Perineal retractors
(l) T incision in prostatic capsule
(m) Enucleation of prostate

Sequelæ (1) Incontinence (of urine)
Due to trauma to sphincter
(2) Stricture urethra
(3) Rectal trauma
(4) Epididymitis
(5) Urinary fistula
(6) Hæmorrhage

(C) *Urethral prostatectomy*

Ind (a) Transverse urethral bar
(b) Prostatic fibrosis
(c) Post-operative tag flap
(d) Middle lobe collar

Pre-oper Cystostomy or urethral drain
Tech Trans urethral punch
Post-oper Urinary drain
Compl (1) Hæmorrhage
(a) Primary
(b) Secondary
(2) Recurrence

(D) *Diathermic removal* suprapubic
(1) *Ainsworth Davis*
(2) *Irwin*
(a) Posterior mobilisation
(b) Division of internal sphincter

Palliative treatment of enlarged prostate

(1) **Catheter life.**
(a) Intermittent auto catheterisation
(b) Continuous self retaining
(2) **Hormonic treatment:**
(a) Testosterone
(b) Steinach I or II
(c) Voronoff testicular graft
(3) **Treatment of complications** As they arise

Main causes of death after prostatectomy.

(1) **Uræmia:**
(a) Acute within first week
(b) Chronic within four weeks
(2) **Shock:** Within first 24 hours
(3) **Hæmorrhage:**
(a) Primary
(b) Reactionary } within first 72 hours

(c) Secondary: end of first week

(4) **Cardiac failure:** Sudden death at any time

(5) **Pulmonary embolism:** Sudden death at any time

(6) **Ascending infection:**
- (a) Starts on 4th or 5th day
- (b) Death in about two weeks

(7) **Pulmonary complications:**
- (a) Œdema
- (b) Collapse } : Starts within first 48 hours
- (c) Pneumonia. starts on 3rd or 4th day

(8) **Mania:**
: Starts within first week

(9) **Pelvic cellulitis:**
: Starts within first three days

(10) **General debility and decubitus**

(III) NEW GROWTHS:

(A) *Benign:*
- (1) Adenoma
- (2) **Fibro-myoma** } : Prostatism

(B) *Malignant:*

(1) Sarcoma:

Etio: Age 3 to 10
: 20 to 40

Clinic Smooth large growth
. With rapid urinary obstruction

(2) CARCINOMA PROSTATE:

Etio: (a) Age. 50–70
- (b) Chronic prostatitis
- (c) Enlarged prostate

Path: Spheroidal or columnar celled

Types. (a) **Histological:**
: Laboratory diagnosis in removed prostate

(b) **Scirrhous:**
: Small, hard, irregular prostate

(c) **Encephaloid:**
: Prostato pelvic
: Rapid, soft enlargement
: Sciatica

(d) **Metastatic:**
- (α) Spontaneous fracture
- (β) Bony tumour or **sclerosis**

Clinic: (1) **Latent:**
- (α) No symptoms: found post mortem
- (β) Very late symptoms

- (γ) Found during prostatectomy
  For simple enlargement
- (2) **Prostatism syndrome**
  - (α) Urinary obstruction
    Rapid and steady progress
  - (β) Urethral hæmorrhage
  - (γ) Pain
    - (1) Local
    - (2) Referred sciatica
      Obturator neuralgia
- (3) Cachexia

Signs
- (1) **P R**
  - (*a*) Character hard soft irregular
  - (*b*) Mobility and adhesions
  - (*c*) Condition of seminal vesicles
- (2) **Catheterisation**
  - (*a*) Difficult
  - (*b*) Hæmorrhage out of proportion
- (3) **Cystoscopic examination**
- (4) **Microscopical examination**
- (5) **Secondaries**
  - (*a*) Pelvic glands
  - (*b*) Bones
    - (α) Fracture
    - (β) **Sclerosis or tumour**
    - In
      - (1) Vertebra
      - (2) Femur
      - (3) Pelvis
      - (4) Rib
      - (5) Clavicle

Compl
- (1) **Urinary obstruction**
- (2) **Urinary ascending infection**
- (3) Urinary hæmorrhage
- (4) Rectal obstruction
- (5) Recto urinary fistula
- (6) Secondaries
- (7) Cachexia

Treat
- (A) **Radical**
  Perineal and suprapubic removal of
  - (*a*) Prostate
  - (*b*) Seminal vesicles
  - (*c*) Vas deferens
  - (*d*) Trigone of the bladder
- (B) **Palliative** ·
  - (*a*) Medicinal morphia cobra venom
  - (*b*) Instrumental
    - (α) Catheterisation
    - (β) Per urethral resection

(c) Surgical
Permanent suprapubic cystostomy
(d) Radiological
(α) Deep X Rays
(β) Radium

(IV) PROSTATIC NEUROSES:

Clinic (a) Difficulty in micturition
Due to (α) Hyperæsthetic & painful prostate
(β) Hyperæsthetic prostatic urethra
(γ) Spasm of prostatic muscles
(b) Neurasthenia

Causes (1) Acute prostatitis
(2) Chronic prostatitis
(3) Sexual excess

Treat (a) Nervine tonics
(b) Treatment of prostatitis

(V) IMPORTANT POINTS

(1) *Prostatitis is most commonly secondary to posterior urethritis, very frequently gonorrhœal, and is due either to natural extension or ill advised instrumentation during acute phase of urethritis*

(2) Radical measures and all kinds of instrumentation of the urethra are contra indicated in T B prostate

(3) Mortality of apparently hopeless cases of prostatic obstruction can be kept to a low figure by careful and prolonged urinary drainage

(4) *Prostatectomy has been made safer by the simple expedient of not being in a hurry after instituting bladder drainage*

(5) *Bilateral vasectomy is a most important procedure in the prevention of needless and sometimes fatal orchitis in old and enfeebled patients*

(6) *Initial tuberculous lesion picks out either seminal vesicle or epididymis*

(7) Prostatic fibrosis leading to bladder neck obstruction constitutes about one third of the total number of cases of prostatism

(8) *In chronic interstitial prostatitis or median bar obstruction, enucleation of the prostate is dangerous,* as no line of cleavage is there, and may result in injury to the bladder, urethra or rectum, so *it should be treated by excision of the bar and re trigonisation*

(9) *Residual urine is an important sign in prostatic obstruction and an indication for prostatectomy.*

(10) Bleeding is less common in malignant than in benign prostate. (Med. Ann 1937)

(11) *A hard area within the prostate*
- (a) *Malignancy*
  - X Ray pelvic bones
- (b) *Calculus*
  - X Ray the prostate
- (c) Distended acini

(12) Together with the vertebræ, the pelvic bones are the commonest sites for secondary deposits in malignant prostate

(13) *Induration of the vesicles raises the suspicion of carcinoma prostate*

(14) *The whole of the prostatic surgery depends on renal function*

(15) *Sudden relief of hyper tension, by passing a catheter and emptying a chronically distended bladder at one stage, or by open suprapubic cystostomy, in acute urinary obstruction is extremely badly tolerated, always leading to*
- (a) Depression of renal function
  - Anuria → Uræmia
- (b) Hæmaturia

(16) Permanent contra indications for prostatectomy
- (a) General incurable diseases or senility
- (b) Regional incurable urinary sepsis or back pressure
- (c) Local inoperable malignancy

(17) Every undoubted case of prostatic obstruction should be operated upon as early as possible provided there are no permanent contra indications.

(18) External urinary drainage routes
- (a) Urethral indwelling catheter
- (b) Perineal
- (c) Suprapubic (α) Indwelling catheter
  - (β) Open cystostomy
- (d) Nephrostomy

(19) *Catheter drainage is essential as a preliminary to suprapubic cystostomy or one stage prostatectomy in the presence of*
- (a) *Infection*
- (b) *Residual urine > 4 ounces*
- (c) *Renal inadequacy*

(20) *No prostatectomy is undertaken—whatever the other tests of renal function may indicate—unless a good blue colour appears in the urine within 10 minutes of intravenous injection of 10 c.cs of 4% indigocarmine*

(21) Prostatectomy eras
(a) Freyer s blind operation
↓ (b) Thomson Walker s open operation
With suture of bleeding points
↓ (c) Harris open operation
Reconstitution of prostatic urethra

(22) *Bimanual intra urethral enucleation of the prostate is the best method,* as it gives the right plane and preserves the floor of prostatic urethra

(23) *All bleeding from prostatic rim and bed must be definitely checked before closure just as bleeding from a tonsil bed*

(24) Sutures in prostatic rim
(a) When bleeding is arterial
In front of bleeding point
(b) When bleeding is venous
Behind the bleeding point

(25) *Never send a patient away till all bleeding from a tonsillar fossa is reliably controlled never close a bladder completely till all bleeding from it is reliably controlled*

(26) Pulmonary embolism is relatively frequent after prostatectomy treat it by prophylactic massage + movements + avoidance of pillows under the knees + avoidance of unnecessary intravenous medication

(27) *Micturition is normally established about the 14th to 18th day after prostatectomy and the wound firmly healed in 3 or 4 weeks*

(28) *Persistent rise in temperature after prostatectomy*
(a) *Ascending urinary sepsis*
(b) *Extravesical cellulitis*
(c) *Epididymo-orchitis*
(d) *Chest condition*

(29) *An examination of cardio vascular system is of signal importance before any operation upon the prostate gland*

(30) A break down of the circulatory system is the most frequent cause of death after prostatectomy

(31) Prostate carcinoma rectal examination
(a) Indurated enlargement of prostate
+ (b) Distension and infiltration of seminal vesicles.

(32) Radical treatment is usually out of question when a definite clinical diagnosis of carcinoma prostate can be made.

(33) *If medical attendants get into the habit of making a rectal examination during all physical examinations on men past 40 years of age many early cases of carcinoma prostate would be discovered*

(34) Main etiological factors in acute prostatitis
- (a) Acute gonorrhœal urethritis
- (b) Urethral instrumentation

(35) Main sign of chronic prostatitis
Threads and commas in urine passed after prostatic massage

(36) *Prostatism urinary obstruction due to abnormal prostate*
- (a) *Middle lobe hypertrophy*
- (b) *Generalised hypertrophy*
- (c) *Scirrhous prostate*
- (d) *Median bar*
- (e) *Post operative flap obstruction*

(37) Indication for prostatectomy
Every case of urinary obstruction due to prostatism, with no permanent contra indications

(38) *Never fail to investigate before operation*
- (a) *Kidney efficiency*
- (b) *Circulatory and blood examination*
- (c) *Local examination*

(39) Temporary contra indications for prostatectomy
- (a) Treatable urinary back pressure
- (b) Treatable urinary sepsis
- (c) Treatable circulatory or pulmonary complication

(40) *Never remove a prostate before fully preparing the patient for the ordeal, treat likely complications*
- (a) *Urinary back pressure syndrome*
- (b) *Urinary sepsis*
- (c) *Pulmonary anticatarrhal vaccines*
- (d) *Gastro intestinal antiseptics*
- (e) *Circulatory digitalis, thyroid*
- (f) *Blood coagulants, transfusions*
- (g) *Acidosis glucose soda bi carb*
- (h) *General sepsis sulphonamides*

(41) Places common for adeno fibro myoma
- (a) Breast
- (b) Uterus
- (c) Prostate
- (d) Parotid

(42) *Etiology of senile prostatic hypertrophy*
- (a) *Neoplastic*
- (b) *Hormonic*
- (c) *Inflammatory*

(43) *Prostatectomy is imperative in*
- (a)
- (b)
- (c)

Cystitis, calculus

(d) *Back pressure effects*
(e) *Residual urine with frequency*
+ (f) *General good health*
+ (g) *Efficient kidneys*

(44) *Common sequelæ after prostatectomy*
(a) Unhealing *suprapubic fistula*
(b) *Difficult urination*
(1) Flap obstruction
(2) Stricture urethra
(3) Recurrence
(4) Malignant prostate
(c) *Incontinence*
(d) *Sterility*
(e) Mental instability

(45) *Common causes of death after prostatectomy*
(A) *Within first week*
(a) *Shock*
(b) Hæmorrhage primary, reactionary
(c) *Anuria*
(d) Acidosis
(e) Heart failure
(B) *Within second week*
(a) *Ascending infection*
(b) Hæmorrhage secondary
(c) Heart failure
(d) *Chest complications*
(C) *At the end of third or fourth week*
(a) *Chronic uræmia*
(b) *Decubitus*
(c) *Pulmonary embolism*
(d) Heart failure
(D) *Any time.*
(a) *Heart failure*
(b) *Pulmonary embolism*

(46) *Death due to uræmia*
(a) *Acute within 3 to 7 days*
(b) *Chronic at the end of 3 to 4 weeks*

(47) Do not fail to examine all the bones in cases of suspected carcinoma prostate, conversely, examine prostate in every case of bone sclerosis in senile males.

(48) *In cases of senile sciatica, rectal examination is imperative*

(49) *Gum elastic catheters are best in prostatism*

(50) *Primary T B in genito urinary system*
(a) *Kidneys*
(b) *Seminal vesicles*
(c) *Epididymis*

(51) *Be sure to get into the right layer of cleavage at the tim of prostatic enucleation;* if real fibrous capsule is interfere with, *following will result:*
- (a) Hæmorrhage
- (b) Excision of vesicles
- (c) Pelvic cellulitis
- (d) Damage to the bladder or rectum

(52) Diagnosis of right layer of cleavage.
- (a) Easy enucleation
- (b) Little hæmorrhage

(53) *Enlarged prostate has two capsules.*
- (a) *Real fibrous capsule*
  : Containing peri prostatic venous plexus
- (b) *Pseudo capsule*
  Of compressed prostatic normal tissue, the line o cleavage is inside the false capsule, i e between i and the adenoma

(54) A large abscess of the prostate should be drained surgicall regardless of whether or not it has burst spontaneously.

(55) There are countless patients being treated for myositis lumbago and sacro iliac strain, by prolonged courses of physiotherapy, diathermy, hydrotherapy, chiropractic mea sures, sacro-iliac belts and even a Taylor's brace, when all the time vesiculitis and prostatitis are the seats of trouble.

(56) *In low backache of unknown origin, an infected prostate as the cause cannot be ruled out until seminal vesicular and prostatic secretions have been proved to be negative on three successive occasions*

(57) Dogs are the only sufferers from prostatic enlargement in the animal kingdom

(58) Prostatic enlargement is very rare in China.

(59) *It is a safe rule never to operate on any patient with an enlarged prostate within at least ten days of the commencement of the preparation by catheter drainage*

(60) *Pressure on the external meatus of the indwelling catheter, is the most potent cause of meatal stricture*

(61) *If there is intolerance to indwelling catheter or if infection is present, a preliminary cystostomy should be done under local anæsthesia before prostatectomy unless acute retention is present, in which case a suprapubic indwelling catheter with gradual decompression should precede the open cystostomy.*

(62) Lymphatic œdema of the scrotum sometimes occurs in malignant prostate (Personal case)

CHAPTER VII

SEMINAL VESICLES AND SPERMATIC CORD

(A) THE SEMINAL VESICLES

(I) TRAUMA:

Etio: Operative trauma in prostatectomy

Compl: (1) Shock
(2) Hæmorrhage
(3) Pelvic cellulitis

(II) INFLAMMATION:

(1) ACUTE VESICULITIS.

Etio: (*a*) Posterior urethritis
(α) Gonorrhœal
(β) Instrumental
(*b*) Prostatitis
(*c*) Cystitis B coli

Bact: (*a*) Gonococci
(*b*) Staphylococci
(*c*) Streptococci
(*d*) Diphtheria bacilli
(*e*) Colon bacilli

Clinic: (1) Signs of prostatitis
(2) Pain
(*a*) Local
(*b*) Testicular
(3) Sexual abnormalities:
(*a*) Premature emissions
(*b*) Painful emissions
(*c*) Blood-stained emissions
(*d*) Painful erections
(4) P. R.
: Tender sausage like swelling

Treat: (A) *Acute stage:*
(1) Stoppage of urethral instrumentation
(2) Pot. citras. + Tr hyoscyamus
(3) Morphia + Ichthyol suppositories
(B) *Sub acute stage:*
(*a*) Bladder distension
↓ (*b*) Vesicular massage
↓ (*c*) Micturition

(2) CHRONIC VESICULITIS

Etio (A) **Tuberculous vesiculitis**

- Path (*a*) Primary
  - (*b*) Secondary to epididymis, prostate
- Clinic (*a*) P R Large nodular, indurated
  - (*b*) T B elsewhere prostate testis
- Treat (*a*) Conservative anti tuberculous
  - (*b*) **Prophylactic vasectomy**
    - In primary cases
  - (*c*) Inguinal route excision

(B) **Gonococcal vesiculitis**

- Cause Chronic gonococcal urethritis
- Clinic (*a*) Gleet
  - (*b*) Sexual irritation
  - (*c*) Bladder neck irritation
  - (*d*) Chronic backache
  - (*e*) P R Enlarged vesicles
  - (*f*) Vesicular massage
    - In upright position

(C) **Septic vesiculitis**

- Cause B coli or instrumentation urethritis
- Clinic (As above)

Compl (*a*) **Epididymo orchitis**
- (*b*) Peri ureteritis stricture ureter
- (*c*) Ascending infection
- (*d*) Renal colic
  - Due to ureteral spasm
- (*e*) Relapsing iritis
- (*f*) **Rheumatism**
- (*g*) Hæmospermia

Treat (1) **Digital evacuation**
- (*a*) Distension of bladder
- ↓ (*b*) Digital vesicular massage
  - In upright position
- ↓ (*c*) Evacuation of bladder

↓ { (2) **Vasotomy**
↓ { (3) **Vesicular lavage** B D for 7 days
- (*a*) 05% argyrol
- (*b*) 1 in 1000 mercurochrome

(4) Excision trans vesical
- Tech (*a*) Suprapubic cystotomy
  - (*b*) Trendelenburg posture
  - (*c*) Incision of bladder base
  - (*d*) Excision of vesicles
  - (*e*) Drainage
    - (α) Vesicular tube
    - (β) Vesical tube
    - (γ) Retzius tube

(3) VESICULAR CALCULI.
Etio: Chronic vesiculitis
: Age past 40
Path: Small and multiple
Clinic: (a) P. R.
(b) X Rays

(III) CYSTS AND TUMOURS:

(1) Vesicular cyst.
Path: Single, unilateral, unilocular
: Contains bloody fluid
Treat: Suprapubic extraperitoneal marsupialisation
(2) Carcinoma of the vesicle.
Clinic: (a) Hæmaturia and hæmospermia
(b) Deep pelvic pain
(c) P. R.: hard nodular mass

(IV) VESICULAR MANIPULATIONS:

(1) **Vesicular massage:**
(a) Urethral irrigation
(b) Bladder distension
(c) Digital massage.
: In upright position
(d) Evacuation of bladder
(2) **X-Rays:**
Ind: (a) Concretions
(b) Calcification
(c) Vesiculography.
Routes: (α) Urethroscope
(β) **Vasotomy**
Medium: Thorotrast 2 c cs
Position: Prone
(3) **Excision:**
(a) Perineal
(b) Inguinal extraperitoneal
: In tuberculosis
(c) Trans vesical (See above)

(B) COWPER'S GLANDS

COWPERITIS:
Etio. Posterior urethritis
Clinic: Bimanual (recto perineal) palpation:
: Tender swelling to one or other side of median raphe
Diff diag: (1) Acute prostatitis
(2) Vesiculitis
(3) **Peri-urethral abscess**
(4) Urethral fistula
(5) **Ischio-rectal abscess**
(6) Fistula in ano

Treat: (*a*) Rest in bed
(*b*) Sitz or hip bath
(*c*) Sulphonamides
(*d*) Drainage of the abscess
(*e*) Excision · in chronic phase

(C) SPERMATIC CORD

(I) CONGENITAL AFFECTIONS:

(1) SHORT CORD.
· Associated with imperfect descent of testis

(2) MISPLACED CORD
· Associated with ectopic testis

(3) PATENT PROCESSUS VAGINALIS:

(A) *Congenital hydrocele*
Def. Collection of fluid in an **entirely unobliterated processus vaginalis**
Clinic (*a*) **Inguino-scrotal swelling:**
(1) Translucent
(2) Pyriform
(3) Dull
(4) **Reducible**
(5) **Impulse present**
(*b*) **Testis enveloped**
Compl. Hernia
Association: Ascites
Treat Excision of the patent process

(B) *Funicular hydrocele:*
Def: Collection of fluid in the **patent funicular process,** shut off from the tunica vaginalis, at the apex of the testis
Clinic: (*a*) **Inguino-scrotal swelling:**
(1) Translucent
(2) Pyriform
(3) Dull
(4) **Reducible**
(5) **Impulse present**
(*b*) **Testis; separate at lower end**
Compl: Hernia
Treat: Excision of the patent process

(C) *Infantile hydrocele:*
Def: Collection of fluid in the patent **processus vaginalis, closed at the internal abd. ring**
Clinic: (*a*) **Inguino-scrotal swelling:**
(1) Translucent
(2) Pyriform
(3) Dull

(4) **Irreducible**
(5) **Impulse absent**
(b) **Testis enveloped**
Treat: (1) Tapping
(2) Tapping + injection
(3) Radical operation:
: Excision

(D) *Hour glass hydrocele:*
Def: Infantile hydrocele, with constriction at external abdominal ring

(E) *Bilocular hydrocele*
Def: Infantile hydrocele with fluid in two pouches, communicating with each other
Path. (a) Scrotal pouch
+ (b) Parietal pouch
(α) Subcutaneous
(β) Inter parietal
(γ) Pro-peritoneal
(δ) Retro peritoneal
Clinic: **Inguino-scrotal swelling:**
(a) Translucent
(b) Cystic
(c) **Partially reducible:**
: From one pouch to the other
Treat: (1) Tap
(2) Tap + injection
(3) **Radical: excision**
Post compl: **Overlooking the parietal pouch**

(F) *Encysted hydrocele.*
Def: Collection of fluid in the **patent middle portion** of processus vaginalis which is closed at:
(a) Internal abdominal ring
& (b) Apex of the testis
Clinic: (1) **Inguino-scrotal or inguinal swelling:**
(a) **Int. abd. ring to apex of testis**
(b) Translucent
(c) Dull
(d) Cystic
(e) Ovoid or round
(f) **Non-reducible**
(g) Impulse absent
(h) Moving with the testis
(2) **Testis: separate at lower end**
Diff. diag: (1) Cyst of the epididymis
(2) Irreducible inguinal hernia
(3) Growth of the cord

Treat: (a) Tapping
(b) Tapping + injection
(c) Radical: excision

(G) *Congenital indirect hernia:*
(a) Of the vaginal process
(b) Of the funicular process
(H) *Infantile indirect hernia*
(a) Intrafunicular
(b) Retrofunicular
(G)–(H): (See under Hernia)

(II) TRAUMA:

(1) ACCIDENTAL TRAUMA.

(A) **Contusion:** Due to a blow

(B) **Diffuse hæmatocele of the cord:**
Path Rupture of one of the veins of Pampiniform plexus
Clinic (a) Muscular exertion
(b) Diffuse hæmatoma
(c) Ecchymosis scrotum
(d) Painful swelling
Treat (a) Conservative
(α) Application of cold
(β) Elevation and support
(b) Incision → removal of the clot

(C) **Local hæmatocele of the cord:**
: Bleeding in encysted hydrocele

(2) OPERATIVE TRAUMA.

(A) **Hæmatocele of the cord:** Pampiniform trauma
(a) Local
(b) Diffuse

(B) **Trauma to vas deferens:**
Treat: (a) Anastomosis over a needle
(b) Vaso ligature

(C) **Trauma to artery**

(3) TORSION OF THE CORD.
. In association with torsion testis (See under Testis)

(III) INFLAMMATION: *Funiculitis*

(1) TRAUMATIC FUNICULITIS:
(A) Contusion
(B) Hæmatoma
(C) Torsion

(2) INFECTIVE FUNICULITIS:

(A) *Acute funiculitis:*

(1) **Acute endemic funiculitis:**
Path: Streptococcal thrombo phlebitis
↓ Streptococcal cellulitis

Clinic (a) Acutely inflamed cord
(b) General septic toxæmia
Diff diag (1) **Strangulated hernia**
(2) Inguinal acute lymphaderitis
Compl (a) **Suppuration**
(b) **Septicæmia**
(c) Acute inflamed hydrocele
Treat (a) Sulphonamides + antiserum
(b) Free incisions and drainage

(2) Ascending urethral funiculitis

Etio Posterior urethritis
(a) Gonococcal
(b) B coli
(c) Instrumentational
(d) Post operative
Associated Epididymo orchitis
Routes (a) Vas lumen
(b) Lymphatics
Treat (a) Stop all urethral treatment
(b) Rest + support + counter irritant
(c) Sulphonamides

(3) Filarial funiculitis

Etio Filariasis
Path Streptococcal lymphangitis → cellulitis
Clinic (a) Recurrent acute funiculitis
(b) Associated filarial syndrome
Elephantiasis scrotum & penis
Treat (a) Sulphonamides + antiserum
(b) Sulfarsenol injections

(B) *Chronic funiculitis*

(1) Tuberculous funiculitis

Etio (a) T B Testis
(b) T B Prostate
(c) T B Vesicles
Path (a) **Ascending**
From prostate or vesicles
(b) **Descending**
From testis
Clinic (1) **Beaded vas**
(2) Associated T B prostate, vesicle or testis

(2) Gonococcal funiculitis
Associated with chronic epididymo orchitis

(3) Filarial funiculitis
Elephantiasis of cord and scrotum

(4) Guinea worm

(3) PROCESSUS VAGINALITIS

Syn **Hydrocele of hernial sac**

Cause Obstructed or strangulated hernia

Clinic **Inguino scrotal swelling:**
- (a) **Irreducible**
- (b) Impulse absent
- (c) **Fluctuating**
- (d) Dull
- (e) Non translucent
- (f) **History of previous hernia**
- (g) Signs of obstruction or strangulation

Treat **Herniotomy** (See under Hernia)

Open the sac and drain the fluid
- (a) *After the protection of incision margins*
- & (b) *Before the treatment of obstructing factor*

(IV) NEW GROWTHS:

(1) *Benign*

(A) **Lipoma of the cord:**

Clinic Multilobular soft tumour
- (a) Coming out of external ring
- (b) Moving with the testis

Compl Traction hernia

Treat Excision

(B) **Fibroma of the cord**

(C) **Lymphangioma of the cord:**

Syn Diffuse hydrocele of the cord

Def Collection of the fluid in the meshes of the connective tissues of the cord

Path Diffuse mass of œdematous cellular tissues

Clinic (1) Inguino scrotal swelling
- (a) Diffuse
- (b) Pyriform
- (c) **Indentable**
- (d) Non-cystic
- (e) Non reducible

(2) Testis separate

Diff diag
- (a) **Varicocele**
- (b) **Filarial funiculitis**
- (c) Hydrocele of the cord
- (d) Inguinal hernia
- (e) Other funicular growths

Treat Excision

(2) *Malignant*.

Secondary to malignant testis

(V) PAMPINIFORM AFFECTIONS:

(1) VARICOCELE:

Def: Varicosity, tortuosity and elongation of the veins of pampiniform plexus of spermatic cord

Etio: (a) **Primary:**
: Congenital abnormality of venous walls
(b) **Secondary:** To back pressure
(α) Malignant kidney:
. Varicocele after 40
(β) Post operative:
. Post herniorrhaphy

Site: **Left side:**
(a) Anatomy of the spermatic vein.
. Entrance at right angles into renal vein
(b) Constipation: loaded colon
: Colon pressure over spermatic vein
(c) Hanging testis.
: Longer cord length

Age. (a) Primary: adolescents 15–25
(b) Secondary. (depends on the cause)

Clinic: (a) **Inguino-scrotal swelling:**
(1) **Worms-in-a-bag** feel
(2) Reducible: on lying down
(3) **Fills from below:** On standing up
(4) Impulse present
(b) **Testis: separate,** tender, hanging
(c) Neuralgia and neurasthenia

Compl. (1) **Thrombosis** of the pampiniform plexus
(2) Testicular **neuralgia**
(3) Neurasthenia

Treat. (A) *Conservative treatment*
(a) Cold bath
(b) Suspensory bandage
(c) Laxatives

(B) *Injection treatment.*

Pre treat Hot bath

Tech: (a) Reversed Trendelenburg or standing posture
(b) Operative preparation of the area
(c) Local anæsthesia
. Below the external ring
(d) Exposure of varicose vein:
(α) Blind prick
(β) Open dissection
(e) Aspiration of blood.
: To be sure of the vein

(f) Injection
(α) 4 c.cs. of quinine urethane
or (β) 2 c.cs. of 5% sod. morrhuate
(g) Support and rest
Result Painful thrombosis
↓ Subsidence in 3 or 4 days
↓ Cure in a few weeks

(C) *Operative treatment*
Ind (a) Public services
(b) Failure of conservatism
(c) Local condition progressive
(d) Neurasthenia not marked
Contraind (1) Marked neurasthenia
(b) Absence of disability
(c) Secondary varicocele
Tech (a) Inguinal or scrotal incision
(b) Excision of anterior group of veins
One inch length
(c) Suture of the stumps together
Post compl (a) Neuralgia testis
(b) Non amelioration
Neurasthenia
(c) Hydrocele of tunica vaginalis
(d) Orchitis
(e) Atrophy of the testis
(f) Recurrence
(g) Un intentional unilateral vasectomy
No effect

(2) PAMPINIFORM PLEXUS THROMBOSIS
Etio (a) Varicocele
+ (b) Trauma
(c) Torsion testis
(d) Contusion of the cord
Clinic (A) Acute
(B) Chronic beading separate from vas
Diff diag (A) Acute
(a) Acute epididymo orchitis
(b) Acute torsion spermatic cord
(B) Chronic
(a) T B epididymitis
(b) New growth of epididymis
(c) T B vas deferens

(3) PAMPINIFORM PLEXUS TRAUMA
Diffuse hæmatocele of the cord (See above)

(VI) GENERAL HYPERTROPHY OF THE CORD:
Associated with · (a) Testicular swellings
(b) Tunica vaginalis effusions

(VII) POST-OPERATIVE CORD:

(1) PRESSURE

Etio Herniorrhaphy
Path Small external ring
↓ Venous back pressure
Compl (a) **Vaginal hydrocele**
(b) **Atrophy testis**
(c) **Varicocele**

(2) NEURALGIA

Syn Neuralgia of the testis & scrotum
Etio Inclusion of the inguinal and genital nerves in sutures

(VIII) OPERATIONS ON VAS DEFERENS.

(1) **Vasostomy**
Ind (a) Intractable vesiculitis
Vesicular lavage
(b) Vesiculography
(2) **Epididymo Vasostomy**
Ind Mechanical aspermia
Tech (a) Hagner s operation
Epididymo vasostomy
(b) Vaso Rete testis anastomosis

(3) **Vasectomy** ·

Ind (a) **Rejuvenation:** Steinach
(b) **Enlarged prostate**
(c) Threatened or recurrent epididymitis
As a block to spread of the infection
(d) T B testis
(e) **Sterility:** Bilateral
Tech (a) Subcutaneous isolation
(b) Local novocain
(c) Incision 5"—1"
(d) Needle transfixation
(e) Isolation
(f) Excision as near the testis as possible
About 1 2 inches
(g) Ligature and carbolisation both ends
(h) Drop in both ends
With septal partition to prevent union
(i) Closure of the wound

(IX) IMPORTANT POINTS

(1) Acute seminal vesiculitis
Clinic (a) Abnormal emissions
Frequent, painful, blood stained

(b) P R tender mass

Diff diag (a) Acute prostatitis
(b) Acute trigonitis
(c) Acute posterior urethritis

Compl Epididymo orchitis

(2) In cases of gonorrhœal obstructive sterility, seminal vesiculography gives graphic evidence as to the patency of the seminiferous pathway

(3) Cure may be spontaneous in
(a) Complete congenital hydrocele
(b) Funicular hydrocele
(c) Infantile hydrocele
(d) Encysted hydrocele
These conditions require conservative methods primarily

(4) *Reducible hydroceles potential hernias*
(A) *Congenital hydroceles of*
(a) Processus vaginalis
(b) Funicular process
(B) *Hydrocele of a hernial sac*
Provided neck is not water tight
(C) *Bilocular hydrocele*
From one pouch to the other

(5) *Irreducible hydroceles*
(a) *Infantile hydrocele*
(b) *Encysted hydrocele*
(c) *Hourglass hydrocele*
(d) *Vaginal hydrocele*
(e) *Hydrocele of obstructed hernial sac*

(6) Bilateral vasotomy should be done in every case of vesiculitis, when four months routine treatment has failed

(7) In vas lavage and instillations be sure that the fluid is injected within the lumen and not outside its sheath

(8) Induration combined with remarkable freedom from pain on palpation is the chief characteristic differentiating tuberculous from other forms of seminal vesiculitis

(9) In primary varicocele, there is usually a late descent of the testis

(10) *Most varicoceles give rise to no symptoms and so require no treatment, a small stationary primary varicocele, unknown to its owner should be ignored*

(11) Varicocele may seem to be non existent if examined in lying down position and in cold weather, it is exaggerated on standing and in hot weather

(12) *Operation is successful in 80% of cases of varicocele but is liable to be followed by hydrocele or testicular atrophy*

(13) In prostatectomy, pelvic cellulitis supervenes if seminal vesicles are injured

(14) Pronounced spermatorrhœa or hæmospermia is due to vesiculitis.

(15) *Tuberculosis starts primarily in vesicles*

(16) Testis is enveloped in
- (a) Congenital hydrocele or hernia of vaginal process
- (b) Infantile hydrocele
- (c) Bilocular hydrocele

(17) Testis is separate and may or may not affect the movements of
- (a) Encysted hydrocele
- (b) Congenital hydrocele of funicular process
- (c) Congenital hernia of funicular process
- (d) Epididymal cysts
- (e) Diffuse hydrocele of the cord
- (f) Benign growths of the cord

(18) *Any inguino scrotal swelling*
- (a) *Inguinal hernia*
- (b) *Spermatic cord affections*

(19) *Differential diagnosis between*
- (a) *Irreducible hydroceles of the cord*
- (b) *Irreducible hernias*

(20) *In every operation on inguinal region, take care of*
- (a) *Pampiniform plexus*
  Hæmatoma of the cord
- (b) *Int spermatic and vas arteries*
  Testicular atrophy
- (c) *Ilio inguinal nerve*
  Neuralgia
- (d) *Torsion of the cord*

(21) *Most common causes of acute funiculitis*
- (a) *Acute torsion testis*
- (b) *Filariasis*
- (c) *Gonorrhœal urethritis*

(22) *Any swelling of the cord moves with testis*

(23) *Varicocele appearing de novo after the middle age, examine kidneys*

(24) Do not operate on varicoceles with marked neurasthenia.

(25) Chief indication for operative treatment of varicoceles is entrance to public services

(26) *Too tight external abdominal ring*
- (a) *Vaginal hydrocele*
- (b) *Atrophy testis*
- (c) *Varicocele*

(27) Differential diagnosis between:
- (*a*) Inguinal hernia: comes from above
- (*b*) Varicocele: fills from below.

(28) *Pathognomonic sign of varicocele is 'worm in the bag' feel.*

(29) Acute endemic funiculitis is due to a streptococcal thrombophlebitis of pampiniform plexus; operation is imperative before the fourth day if death is to be averted.

(30) In vasectomy:
- (*a*) Be sure that it is the vas that is excised
- (*b*) Do not injure the arteries to the testis or vas.

(31) Complications of vasectomy:
- (*a*) Psychical impotence
- (*b*) Atrophy testis: (if arteries are injured)
- (*c*) Neuralgia testis
- (*d*) Continuance of propagation:
  : If vas on one side escapes.

CHAPTER VIII

TUNICA VAGINALIS AND TESTIS

(A) THE TUNICA VAGINALIS

(I) CONGENITAL AFFECTIONS:

NON ISOLATION OF THE TUNICA VAGINALIS

Path Non obliteration of processus vaginalis at the apex of the testis, leading to tunica vaginalis cavity being continuous with the remaining processus vaginalis cavity and sometimes with the peritoneal cavity

Clinic (*a*) Congenital or infantile hydrocele
(*b*) Congenital hernia of vaginal process

(II) TRAUMA:

(1) TRAUMATIC HYDROCELE
Associated with traumatic epididymo orchitis

(2) TRAUMATIC HÆMATOCELE
Associated with trauma to the testis

(III) INFLAMMATION:

(A) *Acute*

(1) Primary acute vaginalitis
(*a*) Polyserositis
(*b*) Pneumococcal
(*c*) Rheumatic

(2) **Secondary vaginalitis:**

Etio Acute epididymo orchitis
(*a*) Traumatic torsion
(*b*) Ascending (α) Gonococcal
(β) B coli
(γ) Instrumentation
(δ) Tuberculous
(*c*) Local Acute tuberculosis

(B) *Chronic*

Secondary to testicular affections:
(*a*) Tuberculosis
(*b*) Syphilis
(*c*) Neoplastic
(*d*) Chronic torsion

Complications of vaginalitis:
(1) Inflamed hydrocele
(2) Pyocele

Treatment of vaginalitis:

(a) Rest and elevation
(b) Counter irritation
(c) Aspiration of inflamed persistent fluid
(d) Treatment of underlying pathology

(IV) HYDROCELE:

Def: Collection of serous fluid in the Tunica Vaginalis

Etio. (A) *Secondary vaginal hydrocele:*

(1) Acute secondary hydrocele:

Cause Acute epididymo orchitis.
(a) Traumatic: acute torsion
(b) Ascending infection
(c) Acute tuberculosis

(2) Chronic secondary hydrocele:

Cause (α) Chronic epididymo orchitis:
(a) Tuberculous
(b) Syphilitic
(c) Gonorrhœal
(d) Chronic torsion

(β) Post operative
(a) Herniotomy
(b) Excision of varicocele

(B) *Primary vaginal hydrocele:*

(1) Acute primary hydrocele:

(a) Polyserositis
(b) Pneumococcal vaginalitis
(c) *Rheumatic vaginalitis*

(2) Chronic Primary Hydrocele:

IDIOPATHIC HYDROCELE.

Etio (a) Chronic trauma
Traumatic secretion
(b) Low grade infection
(c) Venous congestion
Due to gravity
(d) Deficient absorption

Path (1) **Fluid:**
(a) Amber coloured (straw coloured)
(b) Albumin +
(c) Fibrinogen +
(d) *Cholesterol crystals +*

(2) **Tunica:**
(a) Thinned
(b) Thickened
(c) Cartilaginous

(3) **Testis**
- (a) Normal
- (b) Diseased
- (c) Atrophied

(4) **Cord**
- Thickened
- Hypertrophy of cremaster muscle

Clinic Purely scrotal swelling
- (a) Translucent (usually)
- (b) Cystic
- (c) Fluctuating or tense
- (d) Dull on percussion
- (e) Thrill
- (f) Testis enveloped
- (g) Cord palpable at ext ring

Diff diag (A) **Irreduce inguino scrotal tumor**
- (a) Inguinal hernia
- (b) Hydrocele of the cord
  - (α) Cord masked at ext ring
  - (β) Scrot cannot be doubled

(B) **Non translucent scrotal tumor**
- (a) Hæmatocele
  - (α) Injury
  - (β) Malignancy
- (b) Pyocele inflammation
- (c) Chylocele filariasis

(C) **Testicular tumours**
- Enlarged testis

(D) **Epididymal cysts.**
- (α) Cord normal at ext ring
- (β) Testis separate

Compl
- (1) Trauma subcutaneous rupture
- (2) Herniation of hydrocele sac
- (3) Hæmatocele
- (4) Inflamed hydrocele
- (5) Pyocele
- (6) Testicular atrophy
- (7) Mechanical impotence
- (8) Eczema of scrotal skin

Treat (A) *Secondary hydrocele*
- (1) Rest + support + counter irrit
- (2) **Aspiration**
- (3) Treatment of etiology

(B) *Primary hydrocele*
- (1) **Aspiration or Tapping**
  - (a) Avoid veins
  - (b) Avoid testis
  - (c) Avoid sepsis

(2) **Aspiration + Injection:**

Withdrawal of hydrocele fluid by means of a trocar and cannula and the introduction into the sac of a sclerosing solution, sufficiently irritating to produce an aseptic inflammatory reaction of the whole serous lining, ultimately ending in the obliteration of the cavity by fibrosis

Position Supine

Tech (a) *Translucency test*

↓ (b) Tap and drain

Grasp the needle by Spencer Wells

↓ (c) Injection

(α) Quinine urethane 8 c cs.

(β) Quinine urethane 5 c.cs

↓ Lithocaine 5 c cs.

(γ) Lithocaine 8 c.cs

(δ) 2 c.cs. of 6% Sod Morrhuate

↓ (d) *Thorough massage*

After treat Rest + elevation + support

Re tapping after 4 days

Sequelæ (a) Recurrence

Tap + inject again

(b) Hæmatocele

(c) Testicular trauma

(d) Epididymo orchitis

(e) Infection → pyocele

(f) Adhesions → loculations

(g) Gangrene testis

Failure causes (a) Incomplete evacuation of fluid

(b) Failure to tap again within 4–6 days

(c) Untapped loculus

(d) Unsuitable solution

(e) Too large a hydrocele

(f) Chronic hydrocele with thick walls

(3) **Operative treatment:**

Ind Idiopathic primary hydrocele

Incision (a) Scrotal good for drainage

(b) Inguinal good for asepsis

Tech (A) **Eversion of the tunica:**

Ind (a) Thin wall

(b) No adhesions

(c) Medium sized

Tech (*a*) Incise the parietal layer
(*b*) Evert the sac
(*c*) Put in anchor suture
(*d*) Return the testis

(B) **(Partial) Excision of parietal layer:**
Ind (*a*) Thick wall
(*b*) Big size
(*c*) Associated hernia
Tech (*a*) Good hæmostasis
All round running blanket suture
(*b*) Avoid trauma to vas
(*c*) Temporary drain

Post treat Pressure bandage + elevation
Post compl (*a*) **Difficult micturition:**
Treat Aseptic catheterisation
(*b*) **Hæmatoma scrotum:**
Treat (α) Local anæsthesia
(β) Trocar + cannula
(γ) Syringe out the clot
(δ) Elevation + pressure
(*c*) **Infection**
(α) Cellulitis scrotum
(β) Abscess scrotum
(γ) Epididymo orchitis
(δ) Gangrene testis
(*d*) **Torsion of the testis:**
Treat Careful return of the testis
(*e*) **Neuralgia testis:**
Avoid inclusion of nerve
(*f*) **Non-apposition of incision:**
Careful sutures

(V) HAEMATOCELE.

Def Collection of blood in Tunica Vaginalis
Etio (1) Idiopathic · Blood diseases
(2) **Traumatic:**
(*a*) Blow or squeeze
(*b*) Faulty tapping
(3) Acute torsion testis
(4) **Malignant testis**
Clinic (A) *Acute hæmatocele*
(1) **History of trauma**
(2) Scrotal swelling
(α) Non or semi translucent
(β) Cystic
(γ) Painful, tender, inflammatory
(δ) **Retrogressive or intermittent size**

(B) *Chronic hæmatocele*:
- (1) **History of trauma**
- or (1) **Malignant testis**
- (2) **Irregular consistency**
- (3) **Thickened smooth wall**
- (4) Non translucent
- (5) Intermittent size
- (6) Loss of testicular sensation

Sign: (*a*) Aspiration: acute cases
(*b*) Incision: chronic cases

Diff diag (1) **Epididymo-orchitis:**
- (*a*) Acute or chronic
- (*b*) Septic or specific

(2) **Testicular neoplasm:**
: *Malignant testis*

(3) **Vaginal effusions:**
- (*a*) *Hydrocele*
- (*b*) Pyocele
- (*c*) Chylocele

(4) **Hernia**

Compl: (1) **Infection:**
- (*a*) Pyocele
- (*b*) Gangrene scrotum

(2) **Atrophy of the testis**
(3) Thickened tunica

Treat: (A) *Acute recent hæmatocele:*
- (*a*) Conservative:
  - (α) Rest + elevation + cooling + pressure
  - ↓ (β) Pot. iodide for absorption
- (*b*) Manipulative
  - (α) Tapping
  - (β) Cannula—wash. (See above)
  - (γ) Incision → removal of clots

(B) *Chronic hæmatocele*:
- (*a*) Excision of parietal tunica
- (*b*) Orchidectomy:
  - Ind (1) Old cases with no testicular sense
  - (2) Malignant testis
  - (3) Atrophy testis

(VI) PYOCELE:

Def: Collection of pus in Tunica Vaginalis

Etio: (1) Acute or chronic **epididymo-orchitis:**
- (*a*) Traumatic: torsion
- (*b*) Infective: septic
- (*c*) Specific: tuberculous, syphilitic

(2) **Infected vaginal effusions:**
- (*a*) Hydrocele

(*b*) Hæmatocele
(*c*) Chylocele
(3) **Pyæmia:** Pyæmic effusion
(4) Post operative. infection

Clinic: (A) Local:
: Inflammatory cystic scrotal swelling
(B) General:
: Septic toxæmia
: (Mild as compared to quantity of pus)

Diff diag: (1) **Acute epididymo-orchitis**
(2) Testicular malignancy
(3) **Acute vaginal effusions:**
(*a*) Acute hydrocele
(*b*) Acute hæmatocele
(4) **Strangulated hernia**
(5) **Cellulitis scrotum:**
(*a*) Extravasation of urine
(*b*) Filariasis

Treat: (1) General: **Sulphonamides**
(2) Local:
(*a*) Aspiration
(*b*) Incision + drainage

(VII) CHYLOCELE:

Def: Collection of chyle in Tunica Vaginalis
Etio: (*a*) Filariasis
(*b*) Malignant infiltration of lymphatics
Clinic: (1) **Scrotal swelling:**
(*a*) Non translucent
(*b*) Cystic
(2) ***Lymphatic œdema:***
(*a*) Thickened cord
(*b*) Elephantiasis scrotum and/or penis
Compl: Recurrent streptococcal inflammation
Treat: (1) Tapping
(2) Excision:
(*a*) Parietal tunica
(*b*) Scrotal elephantiasis

(B) THE TESTIS

(I) CONGENITAL AFFECTIONS:

(1) **Anorchism:** Absence of both testes
(2) **Monorchism:** Solitary testis (exclude retained testis)
(3) **Polyorchism.** Extra testis
: Epididymal cyst mistaken for third testis

(4) ANTERIOR INVERSION:

Def: Physiological torsion of the testis

Etio 1 in 20
Clinic Epididymis in front of testis
Point Remember in tuberculous epididymitis

(5) HYPO AND MAL DESCENT OF TESTIS:

Syn Retained and ectopic testis

(A) *Imperfect descent*

Class (1) **Normal variations:** (Denis Browne)
- (*a*) **Adult:** Scrotal bottom
- (*b*) **Low retractable:** 'Rabbit' testis
  - (α) Into superficial inguinal pouch
  - (β) Lower limit normal (*a*)
- (*c*) **High retractable·**
  - (α) Into superficial inguinal pouch
  - (β) Lower limit higher than (*a*)

(2) **Retention testis:**
- (*a*) **Mechanical retention:**
  - (α) Normal general development
  - (β) Normal genital development
- (*b*) **Delayed development retention:**
  - (α) Normal general development
  - (β) Sub normal genital development
- (*c*) **Endocrinal retention:**
  - (α) Sub normal general development
  - (β) Sub normal genital development

Sites (A) **Abdominal** (Lumbar and Iliac)
- (*a*) Bilateral cryptorchism
- (*b*) Unilateral pseudo monorchism

(B) **Inguinal:**
- (*a*) Entrant inguinal
  At the internal ring
- (*b*) Middle inguinal
- (*c*) Emergent inguinal
  At the external ring

(C) **High Scrotal:**
Scrotal testis which cannot be made to touch the scrotal bottom

Causes (1) **Inadequate gonadotropic hormone:**
Anterior pituitary

(2) **Mechanical** retention

Path (*a*) No spermatogenesis
(*b*) Normal internal secretion

Clinic: (1) **Absence from the scrotum**

(2) Presence in one of the above sites
(3) **Non-bottom-touching** testis

Diff. diag: (1) **Rabbit testis:**
Diag: (a) Childhood
(b) Testis in superficial inguinal canal
(c) *Testis touches the bottom*: on
(α) Traction
(β) Application of hot water bag:
. To groin, scrotum and perineum

(2) **Tumour:**
(a) Abdominal
(b) Inguinal
(c) Scrotal
Diag. Absence of testis from the scrotum

(3) **Hernia:** *Always present actual or potential*

(B) *Misplaced or ectopic testis.*

Etio: Abnormal gubernacular drag

Sites: (a) **Cruro-scrotal:**
: External abdominal ring
(b) **Superficial inguinal:**
· Over the Poupart's ligament
: In superficial inguinal pouch
Rabbit testis
(c) **Femoral:**
: Scarpa's triangle
(d) **Pre-penile:**
(α) Symphysis pubis
(β) Root of the penis
(e) **Perineal:**
In the perineum
(f) **Pelvic**

Path. (1) Spermatogenesis present
(2) Internal secretion present: except in (f)

Clinic: (1) Absence from the scrotum
(2) Presence in one of the above sites

Complications of retained and ectopic testis:

: (1) Sterility in cryptorchids
(2) **Trauma:**
(a) Inflammation
(b) Atrophy
(c) Malignancy
(3) **Torsion:** of the spermatic cord
(4) Associated **hernia or hydrocele**
(5) **Abdominal crisis:**
: Urethritis → epididymo orchitis
: In abdominal retention

(6) **Malignancy**

Treat (A) **True cryptorchid:** Bilateral abdominal testes
- (a) Watch after 9th year
- (b) Hormone therapy: 10–12 years
- (c) Orchiopexy. 12 to 14 years

(B) **Uncomplicated canal-dwelling testis:**
- (a) Hormone therapy 10–12 years
- (b) Orchiopexy 12–14 years

(C) **Complicated canal dwelling testis:**
- (a) If complication requires treatment:
  Early treatment + orchiopexy
- (b) If complication requires no treatment:
  - (α) Hormone therapy 10–12 years
  - (β) Orchiopexy + complication treat.: 12–14 years

(A) **Denis Browne's normal variation:**
Hormone therapy

(B) **Mechanical retention:**
Orchiopexy

(C) **Delayed development retention:**
Hormone therapy 10–12 years

(D) **End** [illegible]
- (a)
- (b)

(1) *Expectant treatment:*
Spontaneous descent of the testis may be expected to occur very frequently
Normal time to descend
- (a) End of first year
- (b) Upto 9th year
- (c) **At puberty: upto 14 years**

(2) *Hormone treatment*

Ind
- (a) Cryptorchid or canal dwelling testis
- (b) Denis Browne's normal variation
- (c) Endocrinal retention
- (d) Every case between 10–12 years:
  Except mechanical retention

Contraind
- (a) Purely mechanical retention
- (b) Age below 10 years

Age **Between 10 and 12 years**

Injections
- (1) *Pregnyl*. 500 units
  . Intramuscular daily for one month
- (2) Antuitrin S:

Compl: Precocious puberty

(3) *Operative treatment:*

Ind: (a) Purely mechanical retention

(b) Associated complications
(c) Failure of conservatism.
One year after hormone treatment
(d) Age **before 14 years (10-14)**

Operations (A) **Orchiopexy:**
Tech (1) Inguinal herniotomy
↓ (2) Isolation of the cord with testis
↓ (3) Lengthening of the cord
(a) Internal mobilisation
Strip iliac peritoneum medially
↓ (b) *Internal transplantation*
Bring testis and cord out through an opening in conjoint tendon just behind the external ring
↓ (c) Straightening
Divide all vessels and fibrous tissue except vas and its artery
↓ (4) Orchiopexy
(a) Keetley Torek
Anchorage to the thigh
(b) Ombredanne or Mauclaire
Trans-septal
(c) Bottom mattress suture
+ (5) Herniorrhaphy

Post compl (a) **Recurrence**
(b) **Atrophy**

(B) **Orchidectomy.**
Ind (a) Disorganised or diseased testis
+ (b) Normal other testis

(C) **Orchio-Cœlioplasty**
Tech Return of testes into abdominal cavity
Ind Both testes
(a) Incompletely descended
(b) Irreplaceable in the scrotum
Contraind Abdominal crisis as a complication of urethritis, in post operative life
Result (a) Internal secretion present
(b) Spermatogenesis lost.

(II) TRAUMA:

(1) TORSION TESTIS

Etio (1) Normal testis
(2) Misplaced or retained testis
Predisp (A) **Congenital abnormalities:**
(a) Incomplete or mal descent

(b) Patent processus vaginalis
(c) Anterior inversion
(d) Horizontal testis
(e) Presence of mesorchium
(f) Pedicled hydatid of Morgagni

+ (B) **Accidental strain** Leading to
(a) Cremaster contraction
(b) Venous engorgement

(C) **Post operative**
Careless replacement of exteriorised testis

Age (a) Early infancy
(b) Between 16 and 30 years

Pathology
Factors (a) Complete investment by tunica
Of testis epididymis and cord
(b) Bell hanging of testis and adnexa
(c) Spiral cremasteric attachment

Sites (a) 2–5 cms above the summit of testis
(b) Between testis and epididymis
(c) Hydatid of Morgagni

Varieties (a) Horizontal
(b) Vertical

Morb anat (a) Congestion
↓ (b) Thrombosis
↓ (c) Infarction
↓ (d) Gangrene
or (e) Fibrosis with atrophy

Clinic (A) **Acute** *Strangulated hernia syndrome*
(a) Acute inguino scrotal inflammation
(b) Shock + pain + vomits
(B) **Subacute** *Epididymo orchitis syndrome*
(C) **Chronic** *Recurrent testicular crises*
(a) Subacute local signs
(b) Relief after manipulations

Signs **Abnormal position of epididymis**
(a) Horizontal torsion
Epididymis anterior or internal
(b) Vertical torsion
Globus major down

Diff diag (1) [illegible]
(2) [illegible]
(3) [illegible]
(4) **Acute abdomen**

Compl (1) **Gangrene testis**
(2) **Pyocele**
(3) **Atrophy testis**

Treat: (A) **Manipulative correction:**
Ind: (*a*) Early cases
(*b*) Recurrent cases
(*c*) Fully descended testis
Tech: Rotation from within outwards & upwards
Result: Relief of pain
Guide: Relief or worsening of pain
(B) **Operative correction + fixation:**
Ind: (*a*) Failure of manipulations
(*b*) Not very early cases
(*c*) Fully descended testis
Tech. (1) Exposure
(2) Correction of torsion
(3) Fixation of testis:
: Fine silk mattress sutures
. Lateral and medial
(C) **Orchidectomy:**
Ind: (*a*) Gangrene testis
(*b*) Retained or ectopic testis
(*c*) Thrombosis of the cord vessels
(D) **Excision of hydatid:**
Ind: Torsion of the hydatid

(2) CONTUSION TESTIS.

Etio. Blows or squeezes
Clinic: (*a*) History
(*b*) Severe shock + vomits
(*c*) Extreme pain + tenderness
(*d*) Traumatic epididymo orchitis
Compl. (1) Hæmatocele
(2) Infection:
(*a*) Pyocele
(*b*) Epididymo orchitis
Sequelæ (1) Atrophy testis
(2) Malignancy:
(*a*) Real
(*b*) Pseudo:
: Trauma draws attention to already present malignancy
Treat: (*a*) Rest + elevation + support + cooling
↓ (*b*) Counter irritants + support

(3) LACERATION AND WOUNDS

(4) PROLAPSE TESTIS:

Etio: (*a*) Bull gore
(*b*) Mill accidents
Path: Exposure of the testis due to avulsion or laceration of the scrotum

Treat (A) Conservative
- (a) Debridement + toilet
- ↓ (b) Replacement
- ↓ (c) Drainage

(B) Orchidectomy
Ind (a) Gross laceration
(b) Gross infection

(III) INFLAMMATIONS EPIDIDYMO ORCHITIS

(1) TRAUMATIC EPIDIDYMO ORCHITIS

Etio (a) Contusion
(b) Laceration
(c) Torsion
(d) Strain
- (α) Cremaster contraction
- (β) Pampiniform thrombosis
- (γ) Subacute torsion

(e) Post manipulative
- (α) Urethral instrumentation
- (β) Prostatectomy
- (γ) Rectal operations

(2) INFECTIVE EPIDIDYMO ORCHITIS

Types (A) **Primary** Through the blood stream
- (a) Mumps
- (b) Tuberculosis
- (c) Syphilis

(B) **Secondary or ascending**
Infection (a) Gonococcal
(b) B coli
(c) Tuberculosis
(d) Pyococcal
From (a) Urethra
(b) Prostate
(c) Vesicles
Via Vas deferens
(a) Lumen
(b) Peri vas lymphatics

Sites (A) **Epididymitis**
Etio **Urethral sepsis**
Path **Ascending infection**
Route (a) Anterior urethra
↓ (b) Posterior urethra
↓ (c) Prostate + vesicles
↓ (d) Vas deferens lumen or lymphatics
↓ (e) Epididymis
Globus minor → globus major
Bact (a) **Gonococcal**
(b) B-coli

(c) Pyococcal **instrumentation**
(d) **Tuberculosis:** Ascending

(B) **Epididymo → orchitis:**
(a) Ascending infection (See above)
(b) Tuberculosis blood stream
(c) **Mumps:** Blood stream
(d) Syphilis blood stream

(C) **Orchitis:**
Etio Blood borne infections
(a) Tuberculosis
(b) **Syphilis**
(c) **Mumps**
(d) Gout
(e) Typhoid
(f) Zymotic

Clinical types (1) Acute acute inflammatory signs
(2) Subacute
(3) Chronic adhesions, nodules, indurations
(4) Recurrent inflammatory crises

Clinic (A) **Local·**
(a) Painful, tender, enlarged swelling
Epididymis and/or testis body
(b) Associated or non associated hydrocele
(c) Swollen, inflamed cord
(d) Inflamed scrotum
(e) Nodules, indurations, softenings, sinuses. In chronic cases

(B) **General:**
Varying amount of toxæmia

(C) **Etiological:**
(a) *Urethritis* urethral examination
(b) Prostatitis or vesiculitis P R.
(c) Parotitis

Signs and symptoms depend on clinical types

Compl (a) **Vaginal effusions:**
(α) Hydrocele
(β) Pyocele
(b) Gangrene of the testis
(c) Hernia testis
(d) Atrophy testis
(e) Sterility if bilateral

Treat· (A) *Conservative.*
(1) **Primary cause:**
(a) Stop all manipulative treatment
(b) Urinary flushing and antisepsis

(2) **General:**
- (a) Antiseptic Sulphonamides
  Vaccines
- (b) Symptomatic Empirin
  Suppositories

(3) **Local:**
- (a) Support + elevation
  Bridge of adhesive plaster
- (b) Thermo therapy
  - (α) *Lead lotion* or ice bag
    Ind (1) Traumatic inflammation
    (2) Within 48 hours
  - (β) Fomentations
    Ind (1) Infections
    (2) After 48 hours
- (c) Counter irritants or passive congest.
  Scott's dressing
- (d) Punctures of epididymis
  If pain and tenderness
- (e) Puncture of the vaginal effusion

(4) **Special:**
- (a) Gonococcal epididymo orchitis
  10% calcium gluconate 5–10 c.cs
  Intravenous
  Daily for 3 days
  ↓ Alternate day for 10 days
- (b) Mumps orchitis
  - (α) Convalescent serum
  - (β) Epididymal decapsulation

(B) *Operative*

(1) **Incision and drainage:**
Of pyocele

(2) **Epididymis decompression.**
Ind (a) Non amelioration of symptoms and signs by 4th day
(b) Acute coli epididymitis
Tech (a) Spinal anaesthesia
(b) Preparation of scrotum
Avoid iodine
(c) Lateral incision into the testis coverings
(d) Exposure of the whole epididymis and origin of the cord
(e) Isolation, catheterisation and silk-strand drainage of the vas
(f) Incision of hydro or pyocele
(g) Incise & explore the whole epididymis
(h) Drainage of epididymis and the tunica

(3) SPECIFIC EPIDIDYMO-ORCHITIS:

(A) TUBERCULOSIS:

Etio Young adults: 20–30 years

Path: (1) **Primary:**
- Site Globus major
- Route· Blood stream

(2) **Secondary:**
- Site: Globus minor
- Route. Vas deferens:
  - (α) Lumen
  - (β) Peri lymphatics

Primaries: (a) Kidney
- (b) **Seminal vesicle**
- (c) Prostate

Course Ultimately bilateral

Morb anat: (a) Tubercle formation
- ↓ (b) Conglomeration
- ↓ (c) Caseation
- ↓ (d) Abscess formation
- ↓ (e) Secondary infection
- ↓ (f) Sinus formation

Clinical types: (a) Acute
- (b) Subacute
- (c) Chronic

Signs: (1) **Globi**: Major or minor
- (a) **Tender nodule**
- ↓ (b) **Small fluctuating swelling**
- ↓ (c) **Sinus** with adhesions and fibrosis:
  - (α) At the postero inferior angle
  - (β) Anteriorly. (if ant. inversion)

(2) **Epididymis:**
- . **Tender, enlarged, irregular, craggy**
- : With fluctuating and nodular areas

(3) **Testis body:**
- (a) Normal (in early cases)
- (b) Testicular sensation present

(4) **Tunica vaginalis:**
- : Small hydrocele: in 30% cases

(5) **Vas deferens:**
- (a) Normal: in early primary cases
- (b) Beaded:
  - (α) In secondary cases: ascending
  - (β) In late primary cases: descending

(6) **Other testis:**
- : Sometimes affected

(7) **Rectal examination:**
T. B prostate and seminal vesicles
(8) **Kidneys:**
Affected if primary focus
(9) **Other tuberculous manifestations:**
(a) Lungs
(b) Bones
(c) *Lymph glands*
(d) Intestines
(10) **Urine examination:**
(a) Acid sterile pyuria
(b) Cultural examination
(c) Guinea pig inoculation test

Diff diag (1) Any other kind of epididymo orchitis.
(a) Acute
(b) Sub acute
(c) Chronic
(d) Traumatic
(e) Septic
(f) Specific gonorrhœal, **syphilitic**
(2) Testicular growths
(3) Vaginal *effusions*

Compl (a) Suppuration → sinus
(b) Fibrosis → atrophy
(c) ***Spread to genito-urinary system***

Treat. (A) *Acute tuberculous testis*
: **Conservative & symptomatic**
(B) *Chronic tuberculous testis*
(a) **Conservative:**
Ind (α) Very early cases
(β) Very late cases
(γ) Involvement of other organs
Tech General anti tuberculous
(b) **Operative**
(1) ***Scraping*** tuberculous sinuses
(2) **Vasectomy:**
Ind Preventive to the spread
(3) ***Epididymectomy:***
Ind (a) Localised disease
(b) Bilateral disease
(c) Solitary testis disease
(4) **Orchidectomy:**
Ind Unilateral advanced disease
Contraind: (a) T. B prostate or vesicle
(b) *Bilateral affection*

(5) **Young's radical operation:**

Ind: (*a*) Unilateral advanced disease
+ (*b*) Good general condition

Tech. (A) Preliminary vasectomy:
: Of the other side
↓ (B) Perineal stage:
: Excision of. Prostate
. Vesicles
. Ampullæ
: Lower vas
↓ (C) Inguinal or scrotal stage.
: Excision of Vas deferens
. *Epididymis*
: Testis
. Scrotum

(B) SYPHILIS

Path (A) *Congenital:*

(*a*) **Diffuse:**
(α) Painless, bilateral orchitis
↓ (β) Atrophy of the testes

(*b*) **Local gumma:**
(α) Granuloma
↓ (β) Infection
↓ (γ) Ulceration
↓ (δ) Fungation testis

(B) *Early secondary:*
. Painless, bilateral, subacute **orchitis**
(Rarely globus major of epididymis)

(C) *Intermediary or late secondary:*
As in (B)

(D) *Tertiary:*
(*a*) **Local gumma** → Hernia testis
(*b*) **Diffuse fibrosis** → Atrophy

Clinical stages of gumma of the testis:

(A) *Tumour stage.*

(*a*) **Enlargement of testicular body:**
(α) **Painless** and non tender
(β) Heavy
(γ) **Smooth** and globular
(δ) Firm

(*b*) **Early loss of testicular sensation**

(*c*) Small hydrocele

(*d*) Other tissues normal

↓ (B) *Adhesion stage :*
: Red, brawny **scrotal skin** and sub-cutaneous tissues, **adherent to the anterior aspect** of the enlarged testis

↓ (C) *Abscess stage :*
(a) **Fluctuation**
(b) Subacute inflammation

↓ (D) *Ulcer stage :*
(a) **Sloughy stage :**
(α) Wash leather slough
(β) Gummy discharge
(b) **Clean stage :**
. Round, punched out, clean cut ulcer on the anterior aspect with testis in the floor

↓ (E) *Hernia testis stage :*
Testis covered by granulations protruding through the ulcer

Diagnosis : (1) **Relative painlessness**
(2) **Anterior aspect**
(3) **Open ulcer :** Round
(4) **Wash-leather slough**
(5) **Gummy discharge**
(6) **Loss of testicular sensation**
(7) **Other stigmata**
(8) **Effect of pot. iodide**

Diff diag (a) Other causes of **epididymo-orchitis**
(b) Tunica vaginalis effusions .
: **Pyocele**
(c) **New growths** of the testis

Treat · (A) **Anti-syphilitic**
(B) *Orchidectomy*
Ind . (a) Resistant cases
(b) Hernia testis
(c) Atrophied or disorganised testis

(C) GONORRHŒAL EPIDIDYMO ORCHITIS :
: (See under infective)

Clinic . (a) History
(b) **Urethritis :** Present or past
(c) Epididymo orchitis

Signs . (a) Urethral discharge smear · gonococci
(b) Prostatic and **vesicular massage**

Compl : Epididymal fibrosis → sterility

Treat . (a) As in infective epididymo-orchitis
\+ (b) **Intravenous calcium gluconate :**
. (See above)

(D) MUMPS ORCHITIS

Etio Parotitis

Time (a) Between 6th to 11th day of parotitis
(b) Before parotitis

Age 8-25 years

Clinic (a) Parotitis
(b) Orchitis duration 4 days
(α) Unilateral, painful, tender, hard swelling of *the body* → may spread to opposite side
(β) Secondary hydrocele

Sequelæ (a) Resolution
(b) Atrophy
(c) Sterility + impotence + infantilism
If bilateral atrophy
(d) Hydrocele

Treat (a) Convalescent serum
(b) Rest + warmth + support
(c) Epididymis decompression
(d) Steinach or Voronoff
If atrophy

(4) HERNIA TESTIS

Syn Fungus testis

Def Prolapse of a diseased testis through the tunica albuginea and overlying scrotum

Etio (1) **Syphilis**: Gumma
(2) Abscess
(3) **Trauma**: Prolapse
(4) Ulcerating malignancy

Clinic Prolapse of granulations-lined testis:
Through an ulcerating scrotum

Treat (1) **Orchidectomy** with overlying scrotal excision
(2) Anti syphilitic treatment in gumma
(3) Plastic operations in traumatic prolapse

(5) GANGRENE OF THE TESTIS

Etio (a) ***Acute torsion***
(b) Acute orchitis
(c) Acute pyocele

Clinic (a) Acute inflammatory local signs
(b) Acute septic toxæmia

Sequela Fungus testis

Treat (a) Orchidectomy + drainage
(b) Incision → drainage

(IV) NEW GROWTHS:

(A) *Innocent* rare
Fibroma, osteoma myoma, adenoma

(B) *Malignant :* common

Etio : (1) Trauma

(2) Imperfect descent and mal descent ?

Path : (A) TERATOID GROWTHS :

: All three germinal layers

Etio (*a*) Frequency : **50%** of testis tumours

(*b*) Age : **20-40 years**

Sub types : (1) **Tridermal teratoma :**

. Fibrocystic disease

(2) **Solid, homogenous teratoma**

(3) **Unidermal teratoid growths :**

(*a*) **Hypoblastic :**

(α) Papillary adeno-fibroma

(β) Adeno carcinoma

(γ) Spheroidal carcinoma

(*b*) **Mesoblastic :**

(α) Cartilaginous

(β) Myxomatous

(γ) Mixed

(δ) Sarcoma

(*c*) **Epiblastic :**

(α) Dermoids

(β) Squamous carcinoma

(γ) Basal carcinoma

(δ) *Chorion epithelioma*

(4) **Dermoids :**

: Congenital

· Contain sebum, hair, epithelium

Origin . Primitive undifferentiated **totipotent meso thelium** of genital ridge

Metastases : (1) **Lymphatic :** In carcinoma

(*a*) Along spermatic artery

(*b*) Lumbar para aortic glands

(*c*) Mediastinal glands

(*d*) Supra clavicular glands

(2) **Blood-stream ;**

. In sarcoma, chorion epithelioma and late stages of carcinoma

(*a*) Lungs

(*b*) Liver

(*c*) Bones

(B) SEMINO CARCINOMA : **Germinal cell tumours**

Etio : **Age : 40-50 years**

Frequency : **49%** of testis tumours

Path (1) Columnar celled
(2) Spheroidal celled

Origin (a) Germinal epith of seminiferous tubules
(b) Epiblast in teratoid growths

Metastases Lymphatics and lymph glands
(a) Lumbar para aortic
(b) Mediastinal
(c) Supra clavicular
also by blood stream to lungs, liver and bones

(C) SARCOMA

Etio Frequency 1% of testis tumours

Path (a) Round celled
(b) Spindle celled
(c) Lympho sarcoma

Origin Mesoblastic tissue in
(a) Normal testis
(b) Teratoid growths

(D) CHORION EPITHELIOMA

Etio Not very common

Origin Teratoid growths

Clinical course.

(1) Painless, irregular swelling of the testis
(2) Gradual, steady, **progressive** enlargement
(3) Epigastric dyspepsia
Para aortic metastases
(4) Mediastinal syndrome intra thoracic metastases
(a) Shortness of breath
(b) Retro sternal fullness
(5) Supra clavicular swelling
Supra clavicular metastases (personal cases)

Signs (A) *Local*

(1) **Scrotum:** (normal in early stages)
(a) *Adherent, large dilated veins*
(b) Lymphatic œdema
(c) Fungation
(d) Ulceration

(2) **Body of the testis:**
(a) Uniform → nodular, *irregular*, bossy
(b) Hard or soft or pseudo fluctuating
(c) *Heavy*
(d) Loss of testicular sensation

(3) **Epididymis:**
Flattened out and impalpable

(4) **Tunica vaginalis:**
Secondary hæmatocele in 15%

(5) **Spermatic cord:**
Hypertrophied and infiltrated

(6) **Vas deferens:**
Normal

(B) *Distant*

(1) **Abdominal**·
(a) *Para umbilical lumbar swellings*
(b) Ascites

(2) **Chest:**
(a) Signs of retro sternal pressure
(b) *X Ray lungs*

(3) **Supra clavicular region:**
Supra clavicular adenopathy
Two personal cases within 3 months of each other
Patient coming for supra-clavicular mass, testicular tumour not complained of by the patient found on routine examination

(C) *General*
Cancerous cachexia

(D) *Special*
(a) Hormone test Prolan A in urine
Syn Aschheim Zondek or Friedman
Results (α) Less than 500 units
(1) Teratoma
(2) No malignancy
(β) Between 500 — 1500 units
Seminoma
(γ) Between 2000 — 10000 units·
Embryonal carcinoma
(δ) More than 10000 units
Chorion epithelioma
(b) X Ray chest For secondaries
(c) Biopsy Exploration

Individual syndrome

(1) **Teratoma:** 50%
(a) Young age 20–40
(b) Smooth, elastic, symmetrically enlarged
(c) Shape of normal testis
(d) Epididymis normal
(e) Metastases lymphatic and lungs

(2) **Seminoma:** 49%
(a) Age 30 to 50, rare in old age
(b) Irregular, bossy enlargement

(c) Metastases: lymphatic

(3) **Sarcoma**: 1%
- (a) Rapid growth
- (b) Blood metastases: lungs

(4) **Chorion epithelioma**:
- (a) Metastases in:
  - (α) Lungs
  - (β) Supra clavicular
- (b) Pregnancy signs:
  - (α) Gynæcomastia
  - (β) Morning sickness
- (c) Positive pregnancy test:
  - : Prolan A in urine

Diff. diag: (1) **Hæmatocele**
(2) Hydrocele
(3) **Orchitis**:
- (a) Septic
- (b) **Syphilitic**
- (c) Tuberculous
- (d) Gonorrhœal

(4) **Hernia testis**

Treat: (1) **Radical operation**:

Ind: Every case with no contra indication

Contraind: (a) Local: nil
- (b) Regional. metastases
  - (α) Abdominal: adenopathy
  - (β) Chest: lungs
  - (γ) Neck: adenopathy
- (c) General. cachexia

Tech: Removal of:
- (a) Half of the scrotum
- (b) Testis
- (c) Spermatic cord
- (d) Whole of the spermatic vein
- (e) Para aortic lymph glands
- (f) Para aortic cellular tissue:
  - : From renal art. to common iliac art.

(2) **Combined treatment**:
- (A) Orchidectomy + excision cord:
  - . Upto internal abdominal ring
- ↓ (B) Deep X-Rays:
  - . To abdominal lymph area
- ↓ (C) Radium bomb:
  - . To the groin

(3) **Deep X-Rays**:

Ind: Seminomata

(V) MISCELLANEOUS TESTICULAR SYNDROME:

(1) ATROPHY OF THE TESTIS:

Etio: (A) **Inflammatory:**
- (a) Traumatic: torsion
- (b) Syphilitic
- (c) Mumps

(B) **Degenerative:**
- (a) Vascular: late varicocele
- (b) Nerve lesions.
  - (α) Fracture spine
  - (β) Myelitis
  - (γ) Tabes dorsalis
- (c) Pressure:
  - (α) *Hæmatocele*
  - (β) Hernia
  - (γ) *Post operative*
    : Tight ring
- (d) Constitutional:
  - (α) Diabetes
  - (β) Leukæmia

Clinic: Soft, flabby, small testis

Sequelæ: (a) Sterility: if bilateral
- (b) Impotence. if bilateral
- (c) Neurasthenia

Treat: (1) *Vasectomy Steinach*
(See under Endocrines)
(2) Voronoff. Testicular graft
. (See under Endocrines)

(2) NEURALGIA OF THE TESTIS

Def Paroxysmal testicular pain and tenderness

Etio. (a) Primary idiopathic: ? sexual
- (b) Secondary
  - (α) Testicular lesions:
    : Gonorrhœal epididymo orchitis
  - (β) Adnexa lesions:
    - (1) *Varicocele*
    - (2) *Urinary calculus*
  - (γ) Distant lesions:
    - (1) Spinal caries
    - (2) New growths

(3) MALE STERILITY AND IMPOTENCE:

Etio: (1) Impotence
- (a) Congenital malformations:
  : Pseudo-hermaphroditism

(b) Mechanical:
: Large hydrocele
: Elephantiasis scrotum
(c) Psychic
(d) Nervous·
: Tabes dorsalis
: Spinal fractures
: Pituitary dysfunction
(e) Diseases·
(α) Local atrophy
(β) General diabetes
(2) Azoospermia Lack of sperms in semen
(a) Cryptorchid
(b) X-Ray exposures
(c) Vasectomy bilateral
(3) Aspermia Lack of semen
Causes· (a) Urethral obstruction
(b) Vas obstruction . vasectomy
(c) Epididymo-orchitis
Treat: (1) Hagner's operation
: Anastomosis of vas with epididymis
(2) Vas Rete testis anastomosis
(3) Rejuvenation:
: (See under Endocrines)

(VI) EPIDIDYMAL CYSTS:

Etio: (a) Young adults
(b) Over 40
Class: (1) Vestigial cysts
(2) Retention cysts
(3) Polycystic disease
Varieties: (A) SPERMATOCELE: Retention cyst
Etio: Men **under 40**
Site: Globus major
Contents: **'Barley' fluid** with spermatozoa
Clinic: (a) Cystic swelling at the top of the testis:
(1) **Single**
(2) **Unilocular**
(3) **Unilateral**
(4) Big
(5) Soft
(6) Cystic
(7) Translucent
(b) Testis separate
(c) Pull on testis moves the cyst
(B) *VESTIGIAL CYST:*
Etio. Men **over 40**
Site: Globus major

Contents: **Crystal-clear fluid**

Origin: (a) Hydatid Morgagni
(b) Vas aberrans of Haller
(c) Organ of Giraldes
(d) Vas efferens

Clinic: (a) Cystic swellings at the top of the testis:
(1) **Multiple**
(2) **Multilocular**
(3) **Bilateral**
(4) Small
(5) Cystic
(6) Translucent
(b) Testis separate
(c) Pull on testis moves the cysts

(C) POLYCYSTIC DISEASE:
: **Whole of the epididymis** turned into an agglomeration of multiple small cysts

Diff. diag: (1) Encysted hydrocele of the cord
: Inguino scrotal
(2) Vaginal hydrocele.
: Testis enveloped

Treat: (1) Leave alone
(2) Aspiration
(3) Tapping + injection
(4) Excision of the cyst
(5) Epididymectomy. in polycystic disease

(VII) HYDATID OF MORGAGNI:

Anat: (a) Sessile
(b) Pedunculated

Path. (a) Torsion
(b) Cyst

Clinic. (a) *Torsion testis milder symptoms*
(b) Epididymal cyst

Treat: Excision

(VIII) OPERATIONS ON TESTIS:

(1) ORCHIDECTOMY:

Ind: (1) Undescended or mal descended testis
(2) Gunshot wounds and contusions
(3) Torsion → gangrene
(4) Tuberculosis of testis:
: Epididymectomy if early or bilateral
(5) Gumma testis
(6) Fungus testis
(7) New growths
(8) Old hæmatocele:
: *With atrophy of the testis*

Tech (A) Simple orchidectomy:

Steps (a) Incision over external ring
(b) Exposure of spermatic cord
(c) Blunt isolation of the cord
(d) Two transfixion ligatures
No 2 chromic
(e) Division of the cord
Distal to distal ligature
(f) Removal of the testis
Division of gubernaculum
(g) Drainage

Post-compl Slipped ligature → hæmorrhage

(B) Radical orchidectomy

Ind Malignant testis

Route Extraperitoneal

Steps (a) Incision
(1) *Scrotum*
↓ (2) Inguinal canal
↓ (3) Ant superior spine
↓ (4) Tip of 10th rib
(b) Division of abdominal muscles
(c) Medial displacement of peritoneum
(d) Dissection & removal of
(1) Para-aortic lymph glands
(2) Para aortic cellular tissues
From renal to common iliac art.
(3) Whole of spermatic vein
(4) Whole of spermatic cord
(5) Testis and adherent scrotum

(IX) TESTICULAR SWELLING: INVESTIGATIONS

(1) **Size:**
(a) Bigger inflammation, tumour
(b) Smaller atrophy

(2) **Part of the testicle first affected:**
(a) Epididymis
(α) Gonorrhœal inflammation
(β) Tuberculous inflammation
(b) Body of the testis
(α) Syphilis
(β) New growth
(γ) Mumps

(3) **Mode of onset and course:**
(a) Abrupt (α) Torsion
(β) Inflammation
(b) Insidious (α) New growth
(β) Syphilis
(γ) Chronic tuberculosis

(c) Stationary or intermittent
(α) Inflammation
(β) Hæmatocele
(d) Progressive and steady
New growth

(4) **Softening:**
(a) Tuberculous abscess
(b) Softening gumma
(c) Degenerating new growth
(d) Associated vaginal effusion
(e) Atrophy testis

(5) **Weight:**

(a)	+ + +	Hæmatocele New growth
(b)	+ +	Gumma
(c)	+	Orchitis

(6) **Bilaterality:**
(a) (Urethral) Ascending inflammation
(b) Tuberculosis late stages
(c) Syphilis
(d) Epididymal cysts vestigial

(7) **Hydrocele**
(a) Acute inflammation
(b) Chronic small (α) Tuberculosis
(β) Syphilis
(c) Blood stained new growth

(8) **Spermatic Cord·**
(a) Uniform, tender thickening
Ascending inflammation
(b) Beaded vas
Tuberculosis
(c) Irregular infiltration and thickening
New growth

(9) **Lymph glands·**
(a) Lumbar
(b) Iliac
(c) Inguinal if scrotum is affected
(d) Supra clavicular

(10) **Adhesions to the scrotum:**
(a) Anterior (α) Syphilis
(β) T B in anterior inversion
(b) Posterior tuberculosis
(c) Anywhere new growth

(11) **Loss of testicular sensation:**
(a) Syphilis
(b) New growth

(12) **Exploratory puncture:** Of vaginal fluid
- (*a*) To ascertain character of fluid
- (*b*) To ascertain condition of underlying testis or tumour, after evacuation of fluid

(13) **Investigation of etiology:** P. R.
- (*a*) Urethritis
- (*b*) Prostatism
- (*c*) Vesiculitis
- (*d*) Cystitis
- (*e*) Kidneys

(14) **General examination:**
- (*a*) Syphilis
- (*b*) Gout
- (*c*) Lungs

(A) SWELLINGS OF THE EPIDIDYMIS:

(1) **Gonococcal epididymitis:**
- (*a*) Gonorrhœal urethritis *gleet*
- (*b*) Lower urinary inflammation
- (*c*) Uniform thickening of vas

(2) **Instrumentation epididymitis:**
: History of urethral *manipulations*

(3) **Tuberculous epididymitis:**
- (*a*) Nodular, craggy, *softenings*
- (*b*) *Beaded vas*
- (*c*) Primary prostate or vesicle
- (*d*) Sometimes bilateral

(4) **Syphilitic epididymitis:**
: (Very rare, usually affects testis)
- (*a*) First year of syphilitic infection
- (*b*) Small, firm, painless enlargement
- (*c*) No urethritis
- (*d*) Wassermann +

(B) SWELLINGS OF THE TESTICULAR BODY:

(1) *Acute enlargements:*
- (*a*) **Traumatic orchitis:** Torsion
  : History and abruptness
- (*b*) **Mumps orchitis:**
  · Preceding or following parotitis
- (*c*) **Gouty orchitis:**
  - (α) Gouty diathesis
  - (β) No urethritis

(2) *Chronic enlargements:*
- (*a*) **Diffuse syphilitic orchitis:**
  - (α) Firm, smooth, stationary enlargement
  - (β) *Loss of testicular sensation*
  - (γ) Syphilitic stigmata

(*b*) **Gumma testis:**

(1) Firm, smooth enlargement:
: *Loss of testicular sensation*
↓ (2) Adhesion: *anterior*
↓ (3) Softening
↓ (4) Bursting: *wash leather slough*
↓ (5) Gummatous ulcer
↓ (6) Hernia testis
+ (7) Other stigmata
+ (8) Wassermann +
+ (9) *Therapeutic test*

(3) *New growths:*

Types: (*a*) Teratoma
(*b*) Carcinoma
(*c*) Sarcoma

Features: (1) Insidious origin
(2) Steady, **progressive,** often rapid course
(3) Early **loss of testicular outline**
(4) Loss of testicular sensation
(5) **Consistency:**
: **Difference in different parts**
(6) Signs of **infiltration**
(7) **Metastases**

(X) IMPORTANT POINTS

(1) Fluid from a hydrocele is yellow or straw coloured, that from a spermatocele or epididymal cyst is either colourless or milky.

(2) *Beware of injecting pure carbolic acid or carbolic acid and glycerine into the hydrocele sac,* as it gives rise to extensive sloughing of scrotum and testis.

(3) *After every operation upon the testis, scrotum and inguinal canal,* in order to minimise the dead space, it is a good practice to *support the scrotum by Nitschke's scrotal bandage.*

(4) The only objection to injection treatment of hydrocele is that some important underlying lesion, such as malignancy, may be overlooked, *careful palpation after tapping is essential before injection.*

(5) *In operations for hydrocele:*

(*a*) *Handle the testis gently*
(*b*) *Do not injure the vas or include it in anchor suture*
(*c*) *Do not constrict the cord*
(*d*) *Return the testis in its right plane*
(*e*) *Beware of torsion while returning.*

(6) Cystic swellings round about the testis
- (a) Vaginal hydrocele
- (b) Hæmatocele
- (c) Chylocele
- (d) Pyocele
- (e) Epididymal cysts
  - (α) Retention spermatocele
  - (β) Vestigial
  - (γ) Polycystic disease
- (f) Encysted hydrocele of the cord
- (g) Hydrocele of hernial sac

(7) Differential diagnosis as regards testis in cystic swellings
- (a) Vaginal effusions
  Testis eclipsed
- (b) Epididymal or cord effusions
  Testis free at lower pole.

(8) *Acute inflammatory cystic swellings in scrotum*
- (a) *Strangulated hernia*
- (b) *Inflamed hydrocele or chylocele*
- (c) *Recent hæmatocele*
- (d) *Pyocele*
- (e) *Acute epididymo orchitis*
- (f) *Acute torsion testis*

(9) Treatment of secondary hydrocele
- (a) Conservative treatment
- (b) Aspiration if required

(10) Secondary hydrocele is always protective and so its *operative* treatment may lead to neuralgia testis

(11) Incisions for hydrocele
- (a) Scrotal (α) Bad for cleansing
  (β) Good for drainage
- (b) Inguinal (α) Good for cleansing
  (β) Good for associated hernia
  (γ) Bad for drainage

(12) *Hæmatoma of the scrotum is the most common complication of hydrocele operations infection comes next in order*

(13) *Take care of the testis in tapping a vaginal effusion*, translucency test to determine the position of the testis, should always be resorted to before tapping

(14) General toxæmia is not so marked in pyocele or scrotal abscess

(15) Testis reaches
- (a) Internal abdominal ring
  By 6th month of intra uterine life
- (b) External abdominal ring
  By 8th month of intra uterine life

(c) Scrotum:
: At or just after birth.

(16) Abnormal descent of the testis.

(A) Arrested descent.

(a) Lumbar
(b) Iliac } : Abdominal

(c) Inguinal.

(α) Entrant
(β) Middle
(γ) Emergent

(d) High scrotal

(B) Ectopic descent:

(a) Cruro scrotal
(b) Superficial inguinal
(c) Femoral
(d) Pre penile:

(α) Symphysis pubis
(β) Root of the penis

(e) Perineal
(f) Pelvic (abdominal).

(17) The testis, at one time or another, comes under the influence of two hormones, the one in œstrogenic group, the influence of which is to inhibit the growth of the testis and to delay its descent, the other in gonadotropic group—a product of anterior lobe of the pituitary — the effect of which is to stimulate both the growth of the testis and its descent into the scrotum. These substances may exert their specific and apparently opposing influences at different periods, the œstrogenic group being predominant at a time when the testis is an intra-abdominal organ, the gonadotropic group being active in the last months of fœtal life, so that the growth of the testis is stimulated and its descent ensured

(18) The virtue of orchiopexy in rectifying sterility of cryptorchids warrants the performance of the operation in all suitable bilateral cases in men

(19) *Spontaneous descent* of the testis may be expected to occur at puberty very frequently in 4 out of 5 cases of arrested descent

(20) *Hormone therapy* increases the size of the gonads and improves the development of the scrotum, and if there is no anatomical barrier to the descent of the testis, it stimulates the natural process of testicular descent.

(21) *The key to success in orchiopexy, is the absence of tension on the testis in its new position.*

(22) *The treatment of arrested or ectopic testis should be operative, when diagnosed over the age of 10 years and after a waiting period of one year after hormone therapy.*

(23) In bilateral cases of arrested or ectopic testis, the orchiopexy should be in two stages
(a) Lower testis orchiopexy
↓ (b) Three month's interval
↓ (c) Other side orchiopexy

(24) Normal development and function of the testis are dependant upon an adequate secretion of the anterior pituitary gonadotropic hormone

(25) Though orchiopexy is justifiable in young adults, the chance of obtaining an active testis after the age of 20 is probably small

(26) The operation of *septal transposition yields best results* in so far as the position of the testis is concerned

(27) If one testis is in normal position and the other is not completely descended but can be brought into the scrotum by gentle pressure fertility is not impaired and there is no demonstrable change in the individual other than a possible psychological effect from the consciousness that one organ is abnormal If one testis is intra abdominal, the organ will undergo atrophy with consequent loss of spermatogenesis but without loss of interstitial cell function *If both testes are undescended and intra abdominal and at least one is not brought down before the age of 8 years, atrophy of both the testes will occur* with resultant loss of development of seminiferous tubules, loss of the function of germ cells and consequent loss of fertility

(28) *Elevation and support of the testis*
(a) *Relieves pain*
In acute epididymo orchitis
(b) *Increases pain*
In torsion testis

(29) *Nearly all tumours of the testis are malignant*

(30) *In all cases of acute abdomen, do not forget to examine the scrotum*
(a) Strangulated hernia
(b) Acute torsion of the testis
(c) Acute funiculitis and epididymo orchitis.

(31) In the majority of instances when untwisting of a torsion has been performed after the sixth hour, atrophy of the testis ensues eventually

(32) If a patient has lost a testicle through torsion, explore and fix the other side at some convenient time after reasonable convalescence.

(33) Torsion of a mal-descended testis and strangulated hernia may go hand in hand, early exploration is imperative, orchidectomy + herniotomy are the procedures to be followed.

(34) *Apart from orchitis of mumps, acute epididymo orchitis is of utmost rarity in young boys, whereas torsion* of testicular appendages *is not so uncommon* in them

(35) If a boy gives history of scrotal swelling after a sudden attack of pain, torsion of a testicular appendage should be suspected

(36) In true cases of trauma of the testis, there must be constitutional symptoms at the time of injury, and/or, there is local evidence of injury Only too often, injury calls attention to a testicular swelling which has existed for some time

(37) The commonest injury to the testis is a blow or a squeeze, the commonest result of injury to the testis is traumatic orchitis with serum or blood in tunica vaginalis

(38) Epididymitis is secondary to prostatitis and vesiculitis extension being along the perivasal lymphatics, the chief varieties being (*a*) Gonococcal
(*b*) Non gonococcal coliform
(*c*) Tuberculous

(39) *Ascending infection of the epididymis is commonly along the perivasal lymphatics* and follows infections of the posterior urethra prostate or vesicles
(*a*) Insidiously
(*b*) After instrumentations
(*c*) After operations

(40) *Discovery of chronic epididymitis always demands a thorough examination of the lower urinary and genital tracts*

(41) Sequence of affections in epididymo orchitis
(*a*) Ascending infection
 (1) Epididymitis
  (a) Globus minor
  ↓ (β) Globus major
 ↓ (2) Orchitis
(*b*) Blood infection
 (1) Orchitis
 ↓ (2) *Epididymitis*
  (*a*) Globus major
  ↓ (*b*) Globus minor
(c) Trauma Orchitis

(42) *Replacement of retained testis* by operation when carried out at the opportune time stimulates the growth of the hypoplastic testis and prevents atrophy

(43) *Suppuration is rare in gonococcal epididymitis* but occurs commonly in mixed infections, which is sometimes mistaken for T B

(44) *It is unwise to jump to the conclusion that acute epididymo orchitis is necessarily gonococcal*

(45) Unless an abscess forms, operation for acute epididymo orchitis is rarely undertaken, though decompression of epididymis is a valuable step

(46) *Use metaphen for scrotum disinfection, as iodine irritates it*

(47) Treatment of acute epididymo orchitis
   (A) Expectant
      (a) Sulphonamides
      (b) Rest + elevation + (ice → heat)
   (B) Operative
      Decompression of the epididymis

(48) *Calcium gluconate, 10%, 5–10 c cs intravenous on alternate days, gives good results in gonococcal epididymo orchitis*

(49) *Calcium chloride is a strong irritant if injected extra venously, the gluconate is less objectionable in this respect*

(50) *Most common causes of epididymo orchitis*
   (a) *Post instrumental or post operative*
   (b) *Gonorrhœal posterior urethritis*
   (c) *B coli urethritis*
   (d) *Tuberculosis*
   (e) *Traumatic*

(51) Tuberculous epididymitis is nearly always secondary to tuberculous prostate or vesicles, infection extending along peri vas lymphatics

(52) *Decapsulation of the epididymis is an extremely satisfactory measure in acute epididymo orchitis*, whether due to gonococcus or not, convalescence is short, pain is relieved, operation is simple

(53) *Best treatment of tuberculous epididymo orchitis*
   (a) *Epididymectomy (orchidectomy if unilateral)*
   (b) *Contralateral prophylactic vasectomy*
   (c) *General anti tuberculous therapy*
   (d) *Artificial sunlight*

(54) *Following radical excision of the rectum, sterility occurs in nearly 100% of male cases*, epididymo orchitis is frequent and can be prevented by previous vasectomy

(55) *Tuberculosis of epididymis begins more commonly in globus minor than in globus major*, the tubercle bacillus reaches the epididymis along the lymphatics, perhaps also by way of the vas, but not often through the blood stream

(56) *Frequency of testicular atrophy after operation is many a times due to failure to support the testis in the immediate post operative period*

(57) *Syphilis of the testis is comparatively less painful*

(58) Orchitis of mumps is rare before the age of 8 and after 25

(59) Malignant disease of the testis is not more common in the mal descended testis.

(60) *On no account should the testis be squeezed for diagnosis of testicular tumour,* for the fear of neoplastic cells being squeezed into venous or lymphatic channel

(61) *Seminomata are extremely radio sensitive, teratomata are radio resistant*

(62) Average age of a patient with seminoma is 40 years and with teratoma 28 years.

(63) *Radiograph of the lungs should in no case be omitted in suspected malignancy of the testis*

(64) Teratoids are innocent or malignant and contain all layers of germinal cells
- (*a*) Cartilaginous
- (*b*) Sarcomatous
- (*c*) Carcinomatous
- (*d*) Endotheliomatous
- (*e*) Chorion epitheliomatous

(65) Out of the malignant teratoma of the testis, teratomatous hypoblastic carcinoma is most common and occurs between puberty and the age of 30

(66) Indications for replacement of testis in scrotum.
- (*a*) Encouragement of
  - (α) Normal testicular development
  - (β) Spermatogenesis
- (*b*) Lessening of the risk of trauma
- (*c*) Removal of psychic complex

(67) Carcinoma or sarcoma may arise independently or be secondary to teratoma, which represents all layers of cells.

(68) Secondaries in malignant testis
- (*a*) Carcinoma lymphatic
- (*b*) Sarcoma blood stream
- (*c*) Teratoma (α) Lymphatic
  - (β) Blood stream

(69) Pathognomonic sign of epididymal cyst
Testis felt separately below the painless, elastic, globular, translucent, single or multiple swellings

(70) *Movement with the testis is pathognomonic of any spermatic cord swelling*

(71) If urine is free from Prolan A after operation for malignant testis prognosis is good

(72) Pregnancy signs in male
? Testicular teratoid chorion epithelioma.

(73) *Imperfect or mal descent of testis*
- (*a*) *Hormone therapy*
  At the age of 10
- ↓ (*b*) *Watch for one year*
- ↓ (*c*) *Operation orchiopexy*
  At the age of 11 to 14

(74) The principal indication of urgent orchidectomy is torsion testis with unsuccessful untwisting or with gangrene.

(75) Even when damage is severe in trauma testicular repair is possible and conservatism is well repaid

(76) *Remember associated actual or potential hernia in incomplete descent of the testis*

(77) *Imperfectly descended testis cannot be made to touch the scrotal bottom*

(78) A mobile testis retracts into superficial inguinal canal, which is superficial to external oblique aponeurosis

(79) Most common etiological factors of malignant testis
- (a) Trauma
- (b) Incomplete or mal descent

(80) *Torsion of the testis*
- (a) *Strangulated hernia syndrome*
- (b) *Acute epididymo orchitis syndrome*
- (c) *Recurrent testicular crises*

(81) *Every case of suspected acute abdomen examine*
- (a) *Chest*
- (b) *Spine*
- (c) *Scrotum*

(82) *Etiology of epididymo orchitis*
- (A) *Acute*
  - (a) *Gonococcal* } *Urethritis*
  - (b) *B coli* } *Urethritis*
  - (c) *Instrumentation* } *Urethritis*
  - (d) *Tuberculosis sometimes*
- (B) *Chronic*
  - (a) *Chronic gonorrhœal*
  - (b) *Tuberculosis*
  - (c) *Syphilis*

(83) *Stop all urethral manipulations in the presence of epididymo orchitis*

(84) *Differential diagnosis between tuberculosis and syphilis*
- (a) *Tuberculosis*
  Tortuous sinus on posterior aspect
- (b) *Syphilis*
  Open ulcer on anterior aspect

(85) In every case of testicular swelling determine the site of advanced signs
- (a) Epididymis
  - (α) Tuberculosis
  - (β) Ascending infection
    - (1) Gonorrhœa
    - (2) Instrumentation

(*b*) Body of the testis
 (α) Syphilis
 (β) New growth

(86) *Any abscess on the anterior aspect of testis ? Gumma*

(87) Malignant testis
 (*a*) Teratoma 50%
 (*b*) Carcinoma 49%
 (*c*) Sarcoma 1%
 (*d*) Chorion epithelioma rare.

(88) *Chief secondaries in malignant testis*
 (1) *Para aortic adenopathy*
 (2) *Supra clavicular adenopathy*
 (3) *Lungs screen or X Ray the chest*

(89) Cystic swellings in the scrotum with testis separate
 (*a*) Encysted hydrocele of the cord
 (*b*) Congenital hydrocele of funicular process
 (*c*) Hydrocele of the hernial sac
 (*d*) Epididymal cyst

(90) *Pathognomonic sign of malignant testis*
Loss of testicular outline

CHAPTER IX

THE PENIS AND THE SCROTUM

(A) THE PENIS

(I) CONGENITAL ABNORMALITIES:

(1) RUDIMENTARY PENIS

Path In association with pseudo-hermaphroditism

Cause Under-development

Clinic Resembles clitoris

(2) DOUBLE PENIS Rare

(3) WEBBED PENIS

Def Penile under surface attached to scrotum by a fold of skin

(4) SHORT FRÆNUM

Clinic (a) Glans curved downwards

(b) Difficult and painful coitus

Compl (a) Frænal hæmorrhage

(b) Frænal ulcer

(5) HYPOSPADIAS PENIS (See under Urethra)

(6) EPISPADIAS PENIS (See under Urethra)

(7) PSEUDO HERMAPHRODITISM

Def Resemblance to opposite sex due to development of opposite sex rudiments

Etio 95% of pseudo hermaphrodites are males

Path (A) External

Boys with under-development of external genitalia, which resemble female organs

(a) Penis clitoris like

(b) Scrotum bifid

(c) Testes retained

(d) Urethra hypospadias perinealis

(B) Internal

(a) External genitalia normal

(b) Internal genitalia of opposite sex

Clinic (a) External genitalia resembling female

(b) Male secondary sexual characters

(c) Male or female psychology

(8) PHIMOSIS

Def **Difficulty in the retraction of the prepuce over the glans, due to undue narrowness of the preputial orifice**

Varieties (1) **Congenital:**

Associated (a) Pin point external meatus

(b) Preputial adhesions

(2) **Acquired:**
 (a) Temporary:
 : Due to inflammatory œdema
 (b) Permanent:
 : Due to fibrosis

Clinic: Inability to uncover whole of the glans

Compl: (A) **Micturition:**
 (a) Difficult micturition
 (b) Acute retention
 (c) Chronic retention → back pressure
 (d) Incontinence' enuresis

(B) **Glans and urethra:**
 (a) Balano posthitis → Bubo
 (b) *Paraphimosis*
 (c) Calculus:
 (α) Preputial
 (β) Urethral
 (γ) Vesical
 (d) Ascending infection

(C) **Genital:**
 (a) Masturbation
 (b) *Difficult coitus:*
 (α) Multiple fissures of preputial orifice
 (β) Paraphimosis

(D) **Straining syndrome:**
 (a) Hernia
 (b) Prolapse ani
 (c) Hæmorrhoids

(E) **Malignancy**

Treat: (A) Acute inflammatory phimosis:
 : **Dorsal slit**
 (B) Congenital and fibrous phimosis:
 : **Circumcision**
 (C) Pin-point meatus.
 : Meatotomy

(9) PARAPHIMOSIS:

Def: **Inability to draw the phimotic prepuce forwards over the glans,** after it has been retracted behind it

Clinic: (1) Œdematous and cyanosed glans
 (2) Constriction behind the glans
 (3) Œdematous preputial collar:
 : Behind the constriction

Compl: **Strangulation** → phagedæna

Treat: (A) **Reduction:**
 (1) **Manual:**

(a) Wrap in cotton wool with
. Adrenaline 1% + Cocaine 10%
For 15 minutes
(b) Smear with vaseline
(c) Manual reduction

(2) **Acupuncture:**
Multiple punctures

(3) **Division of constriction band**

↓ (B) **Dorsal slit**

↓ (C) **Circumcision:**
Ind After disappearance of inflammation

(II) TRAUMA:

(1) CONTUSION OF THE PENIS
Etio Trauma during erection
Path Extravasation of blood
In corpora cavernosa
Clinic Painful, tender, discoloured swelling
Treat (a) Conservative
Cold evaporating lotions
(b) Aspiration

(2) FRACTURE OF THE PENIS
Clinic (a) History of trauma during erection
(b) Excruciating pain
(c) Sudden distal flaccidity
(d) Swelling
Treat (a) Explorative incision
↓ (b) Turn out the clot
↓ (c) Repair by sutures

(3) DISLOCATION OF THE PENIS
Def Misplacement of corpora under the skin and subcutaneous tissues of the pubis, due to violent drag on the penile skin + lateral force
Clinic (a) Flaccid cutaneous sheath of the penis
(b) Body of the penis felt elsewhere
Treat Replacement

(4) LACERATION OF THE PENIS Skinning
Etio (1) Mill accidents
(2) *Faulty circumcision*
Retraction of the skin after cutting
Clinic Corpora laid bare
Treat Skin-grafting

(5) STRANGULATION OF THE PENIS
Etio (a) *Paraphimosis*
(b) Constricting bands or rings
Clinic (a) Œdematous, turgid distal portion
(b) Deep furrow
. With buried etiology

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: Due to inflammatory œdema
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Clinic Corpora laid bare
Treat Skin-grafting

(5) STRANGULATION OF THE PENIS
Etio (*a*) Paraphimosis
(*b*) *Constricting bands or rings*
Clinic (*a*) Œdematous turgid distal portion
(*b*) Deep furrow
With buried etiology

Compl: (*a*) Distortion
(*b*) Partial flaccidity
(*c*) Phagedaena
Treat: (A) Reduction of distal turgidity
(*a*) Lead lotion or adrenaline compress
(*b*) Aspiration of corpora cavernosa
↓ (B) Sliding the foreign body down:
: Application of a lubricant
or (C) Nicking or dividing the etiology

(III) INFLAMMATION:

(1) BALANITIS: Balano posthitis

Def: Inflammation of the glans and mucous membrane of the prepuce

Path. (A) *Acute:*
(*a*) **Phimosis**
(*b*) **Venereal** diseases
(*c*) Vincent's spirochætal

(B) *Chronic:*
(*a*) Urethritis
(*b*) Phimosis
(*c*) **Diabetic**
(*d*) **Leukoplakic**
(*e*) Paget's disease

c· (A) **Acute balanitis:**
(*a*) Œdematous inflamed prepuce:
. With acute phimosis
(*b*) Purulent copious discharge
(*c*) Inguinal lymphadenitis

(B) **Chronic balanitis:**
(*a*) Sanious scanty discharge
(*b*) Preputial adhesions or calculi
(*c*) Contraction of preputial orifice.
: Chronic phimosis
(*d*) Enlarged inguinal glands

l (1) Acute or chronic **phimosis**
(2) Preputial **phagedaena**
(3) Preputial **adhesions** or calculi or ulcers
(4) Lymphangitis → **lymphadenitis**

t: (A) **Dorsal slit**
↓ (B) **Antiseptic baths**
↓ (C) **Circumcision:**
Ind: Subsidence of acute inflammation

:NILE LYMPHANGITIS:

›: (*a*) Acute **balanitis**
(*b*) **Venereal** lesion
(*c*) **Herpes**

Clinic: Œdema and red streaks on penis

Compl: (a) Inguinal **bubo**
(b) Phagedæna

Treat: (a) Treat the etiology
(b) Sulphonamides

(3) PHAGEDÆNA

Def. Acute ascending gangrene of the penis

Etio. (a) **Acute balanitis**
(b) **Paraphimosis**
(c) Constriction
(d) **Extravasation** of urine
(e) **Venereal** focus chancre or chancroid
(f) **Circumcision:**
During acute inflammation
(g) Virulent infection
Anærobes

Clinic: Acute ascending gangrene

Compl (a) *Loss of penis*
(b) Spreading gangrene
(c) Secondary hæmorrhage
(d) Septicæmia
(e) Urethral stricture

Treat (a) Hydrogen peroxide irrigations
(b) Amputation with cautery
Well clear of the lesion

After treat. Regular intermittent urethral dilatation

(IV) VENEREAL DISEASES: Of the penis

(1) SYPHILIS

(A) *Hard chancre*

Clinic (a) **Single** Papule at (1) Preputial orifice
(2) Preputial muc. mem
(3) Glans
(4) Corona glandis
(5) Meatus
(6) Penile skin
(7) Scrotal skin
(b) Rose pink hand
(c) **Indurated,** rubbery feel
(d) **Indolence:** Painless
(e) Painless, **discrete lymph nodes**
(f) *History of* ***exposure*;**
: More than 9 days previous

Compl. (a) Syphilitic indurative œdema
(b) Phimosis
(c) Phagedæna

(B) *Secondary lesions:*
- (a) Rashes
- (b) Warts
- (c) Condylomata

(C) *Tertiary subcutaneous gummata*

Treat: Of syphilitic lesions

(2) SOFT CHANCRE.

Def: Ulcers due to infection by Ducrey's bacillus, invariably caused by sexual contagion

Clinic:
- (a) **Multiple**
- (b) **Very painful**
- (c) Acute
- (d) **No induration**
- (e) **Suppurating bubo**
- (f) **Short incubation:** Within 5 days

Compl.
- (a) Suppurating inguinal bubo
- (b) Phimosis
- (c) Phagedæna

(3) LYMPHOGRANULOMA INGUINALE:

Def A chronic granuloma due to Leishman Donovan bodies

Clinic Red granulomatous mass situated on indurated fibrosis *spreading from*
Groin → penis → scrotum → perineum → anal canal

Compl:
- (a) Stricture or ulcers of anal canal
- (b) Peri anal and perineal sinuses
- (c) Recto vaginal fistulæ

Diag Frei's test
Dermal test by Frei's antigen from glands of similar cases

Diff diag
- (a) Malignancy
- (b) Tertiary syphilis

Treat (A) Local
- (a) Excision
- (b) Scraping
- (c) Cautery

(B) General
- Intravenous 1% tartar emetic
- *One dozen injections*

(V) NEW GROWTHS:

(1) PAPILLOMA:

(A) Hard:

Clinic: Warts

Compl: Carcinoma

(B) Soft:

Etio:
- (a) Balanitis
- (b) Venereal

(2) CARCINOMA :
Etio : (*a*) Chronic **balanitis**
(*b*) **Phimosis**
(*c*) **Leukoplakia**
(*d*) Venereal lesions :
: Warts and chancroid scars
(*e*) Paget's disease

Incidence . (*a*) Average age 57 years
(*b*) Common in Chinese
(*c*) **Rare in circumcised races :**
: Jews and Muslims

Clinical types : (1) **Warty** : Infiltrating, hard or soft
(*a*) Flat
(*b*) **Papillary : Fungating**
(2) **Ulcerative** : Everted, indurated, friable
(3) **Indurative** : Induration under the prepuce
(4) **Balanitic** : (*a*) Signs of balanitis
↓ (*b*) Perforation of prepuce
↓ (c) Fungation
(5) Fistulous

Compl : (*a*) **Secondary glands :**
{ (α) Inguinal
{ (β) Femoral
(1) Inflammatory 50%
(2) Malignant 50%
(*b*) **Fungation :**
(α) Local
(β) Glands
(*c*) *Secondary hæmorrhage :*
(α) Dorsal vessels of the penis
(β) External iliac or femoral artery
(*d*) **Urinary complications :**
(α) Obstruction : back pressure
(β) Sepsis : ascending
(Υ) Fistulæ
(*e*) **Urethral stricture**

Treat : (A) *Local :*
(1) **Partial amputation** of the penis :
Ind : (*a*) Involve of less than distal half
(*b*) Stump sufficient to project the urinary stream clear of scrotum
(2) **Radical excision**
(3) **Radium therapy**
With : Suprapubic drain
(B) *Glands :*
(1) **Surgical excision**
(2) **Deep X-Rays**
(3) **Radium**

(VI) MISCELLANEOUS:

(1) PRIAPISM.

Def Painful persistent involuntary non sexual erection
Etio (*a*) **Reflex irritation.** Rectum or anal canal
(*b*) **Post operative:** Circumcision
(*c*) **Thrombosis:**
(α) Traumatic
(β) Arteriosclerotic
(γ) Leukæmic
(*d*) **Nerve lesions:**
(α) **Traumatic: Fracture spine**
(β) Central nervous lesions
Treat (1) Sedatives + local ethyl chloride spray
(2) Aspiration → normal saline wash outs
(3) Incision → glove drain of the corpora
(4) Ligature of both dorsal arteries

(2) CHORDEE

Def Painful curved erection of penis
Etio (*a*) **Acute urethritis:** Gonorrhœal
(*b*) Corporal effusion or thrombosis
Treat (See under Priapism)

(3) HERPES

Sites (A) Ilio inguinal
(B) Glans
(C) Preputial
Clinic Row of small vesicles → ulcers
Treat Wash → Dust with bismuth formic iodide

(4) INDURATIO PENIS PLASTICA

Def Slowly developing painless induration of the penis, starting in the dependant part
Etio Age over 40 years
Path (*a*) Fibrous contracture?
(*b*) Lymphogranuloma inguinale?
Treat Pot. iodide + fibrolysin

(VII) PENILE PAIN:

(1) PAIN DURING MICTURITION

(A) *Diseases of the urethra*
(1) Acute urethritis
(*a*) Smarting or tingling
↓ Burning or scalding
(*b*) Urethral discharge
(2) Urethral calculus
(*a*) History of renal or vesical calculus
(*b*) Sharp cutting pain
(*c*) Acutely obstructed urinary flow
(*d*) Palpation
(*e*) Sounding

(3) Urethral stricture
- (a) Gradually increasing difficulty
- (b) Feeble stream or dribbling
- (c) Difficult catheterisation

(4) Urethral trauma
- (a) Etiology
  - (α) Perineal trauma
  - (β) Fracture pelvis
  - (γ) *Faulty instrumentation*
- (b) Perineal contusion
- *or* (b) Urethral hæmorrhage
- (c) Difficult micturition
- (d) Urinary extravasation
- (e) Difficult catheterisation

(5) Urethral foreign body (See under (2))
- (a) History or no history
- (b) Local pain
- (c) Urethral discharge
- (d) Difficult micturition
- (e) Palpation
- (f) Sounding

(B) *Diseases of the Prostate*

(1) Acute prostatitis and abscess
- (a) Urinary syndrome
  Frequency + difficulty + pain
- (b) General toxæmia fever
- (c) Perineal discomfort
- (d) P R

(2) Prostatic carcinoma
- (a) Prostatism syndrome
- (b) P R fixed immovable infiltrating, indurated

(3) Prostatic calculus
- (a) Prostatism syndrome
- (b) P R. grating
- (c) Catheterisation grating

(C) *Diseases of the bladder*

(1) Acute cystitis
- (a) Suprapubic pain
- (b) Urinary syndrome
  - (α) Frequency
  - (β) Pus and blood in urine
- (c) Pyrexia

(2) Vesical calculus
- (a) Terminal pain
- (b) Sounding
- (c) X Ray
- (d) Cystoscopy

(3) Vesical papilloma:
(a) Recurrent profuse painless hæmaturia
(b) Cystoscope
(4) Vesical carcinoma:
(a) Hæmaturia
(b) P. R.: infiltrating induration
(c) Cystoscope

(II) PAIN FOLLOWING MICTURITION. Terminal urethral pain
(A) *Diseases of the bladder*:
(1) Vesical calculus:
(a) Frequency of micturition:
: Affected by work and rest
(b) Terminal painful hæmaturia
(c) Sudden stoppage of stream
(d) Previous history of renal colic present or absent
(e) Sounding
(f) Cystoscope
(2) Vesical tuberculosis:
(a) Insidious cystitis in young adults
(b) Frequency of micturition:
: Independent of work and rest
(c) Focus in kidney, prostate or testis
(d) Culture
(e) Guinea pig inoculation
(3) Vesical tumours:
(a) Elderly patients
(b) Frequency of micturition:
: Independent of work and rest
(c) Hæmaturia painless and profuse
(d) P. R.
(e) Cystoscope
(f) Cystogram
(4) Acute trigonitis:
(a) Irritative
(b) Infective
(c) Reflex
(B) *Diseases of the ureter*:
(1) Ureteric calculus:
(a) Increased frequency
(b) Terminal pain
(c) Hæmat or py-uria · slight
(d) Renal aching and fullness
(e) Past history of renal colic
(f) P. R.
(g) X Rays:
(α) Plain
(β) Pyelogram
(h) Cystoscopy:
(α) Congested ureteral orifice
(β) *Ureteral bougie*

(2) Descending ureteritis

Path (a) Tuberculous
(b) B coli communis
(c) Staphylococcal

Clinic (a) Abnormal urine
Bacilluria, pyuria
(b) Frequency of micturition
(c) Penile pain
(d) Kidney examination
(e) P R
(f) X Rays pyelogram
(g) Cystoscope
Horse-shoe or golf hole orifice

(C) *Diseases of the prostate*

(1) Acute prostatitis and abscess
(a) Penile pain
(b) Perineal discomfort
(c) Priapism
(d) P R.

(2) Prostatic calculus Prostatic urethral
(a) Obstructed flow
(b) P R. tenderness
(c) Catheter grating

(D) *Diseases of seminal vesicles*
(a) Urinary syndrome
(b) Genital syndrome
(c) Rectal syndrome

(E) *Rectum and anus lesions*
(a) Rectal carcinoma
(b) Anal fissure
(c) Inflamed hæmorrhoids

(III) PAIN APART FROM MICTURITION
(1) Acute urethritis Anterior
(2) Balanitis With or without phimosis
(3) Chordee
(4) Epithelioma
(5) Herpes genitalis
(6) Cavernitis gouty or syphilitic
(7) Renal colic
(8) Acute pelvic appendicitis
(9) Neuralgia
(10) Leukæmia
(11) Varicocele

(VIII) PENILE ULCERS:

(1) *Simple preputial fissure*

Etio Phimosis with friction
Site Orifice of the prepuce

Clinic: Multiple, longitudinal, painful fissures

(2) *Balanitis:*

Etio: Phimosis; diabetes, gout; venereal diseases

Age: Any

Clinic: Multiple shallow ulcers, under the œdematous and inflamed prepuce, with stinking and purulent discharge

(3) *Chancroid*

Etio. Sexual contagion

Incubation **Short** One week

Site: Glans, frænum, corona

Clinic **Multiple**, rounded or oval, punched out or sharp-edged **painful** ulcers with sloughy base and thin, purulent discharge.

Associated: **Suppurating inguinal bubo**

Result: **Depressed scars**

(4) *Chancre.*

Etio: Sexual contagion

Incubation· **Long**: One month

Site. Frænum, coronary sulcus

Clinic: **Single**, raised red patch with **indurated** margins and central ulcer with thin purulent discharge and relative **painlessness**

Associated· (*a*) **Non-suppurating, discrete, fleshy glands**
(*b*) Secondary syphilitic signs
(*c*) Wassermann or Kahn

Result **No scar; Reaction to treatment**

(5) *Epithelioma*

Etio. Chronic lesion in the aged

Site. Prepuce, glans

Clinic: Small, **raised**, single, **progressive** ulcer with **friable**, irregular, **everted** edges; surrounding **infiltrating induration** and sanious discharge

Associated Enlarged inguinal glands

Result. Progressive **ulceration and fungation**

(6) *Gummatous ulcer*

Etio: Tertiary syphilis

Site: Glans, prepuce, body of the penis

Clinic· (*a*) Small elevated nodule
↓ (*b*) Ulcer with thin edge and sloughy base

Associated. (*a*) Wassermann or Kahn
(*b*) Other syphilitic stigmata

Result: Reaction to anti-syphilitic treatment **+ Pot. iodide**

(7) *Herpes progenitalis*

Site. Inguinal region, glans, prepuce

Clinic Erythema → vesicles → pustules → ulcers.
(a) Linear row of multiple vesicles → ulcers
(b) Neuralgic pains
Result · Recurrence
(8) *T. B or Lupus.*
Etio. Rare
Clinic. Multiple, painful, shallow ulcers with thin overhanging edges.

(VIII) OPERATIONS ON PENIS:

Pre operate: (a) Kidney function
(b) Urinary sepsis
(c) General health
(d) Metabolic diseases

(1) CIRCUMCISION.
Ind: (a) Phimosis: (α) Congenital
(β) Acquired
(b) Pathological lesions.
(α) Ulcers
(β) Chancre
(γ) Warts
(δ) Epithelioma
(c) Social or religious
Contraind: *Acute local sepsis*
Anæsth: (1) General
(2) Sacral: 40 c.cs. of 2% novocain
(3) **Regional block:**
: Novocain around the penile base
(4) Local base of the prepuce
Methods. (1) Clamp method: *beware of glans*
(2) **Open method**
Steps: (a) Separation of preputial adhesions
(b) Dorsal slit
(c) Cut parallel to and *at a distance* from the coronal sulcus
(d) Hæmostasis.
(α) Frænal:
: Three in one frænal stitch
(β) Dorsal vein
(γ) Dorsal arteries
(e) Sutures:
(α) Four angular anchor sutures
(β) Intervening apposing sutures
(f) Examination of external meatus:
: Meatotomy if necessary
(g) Vaseline acriflavine dressings
Post-compl: (1) **Penile skinning:**
Cause: Removal of too much skin
Treat: (a) Skin grafting

(b) Suture of basal skin to preputial muc. membrane cuff around the corona

(2) **Oedema**
(a) All round
(b) Frænal

(3) **Hæmorrhage** Frænal
(a) External soaking
(b) Hæmatoma

(4) **Priapism**
Treat (a) Sedatives bromides
(b) Ethyl chloride spray

(5) **Frænal ulcer**
(6) Scar contraction
(7) Sexual frigidity
Insensitive glans

(8) **Phagedæna**
Cause *Circumcision during acute balanitis*

(2) PARTIAL AMPUTATION OF THE PENIS
Ind (a) Carcinoma
(b) Phagedæna
+ (c) Prospect of leaving a stump capable of projecting the urine clear of the scrotum
Methods (1) Flap method
(a) Long dorsal
(b) Long ventral
(2) Circular method
(3) Elliptical method
Tech (a) Cut the urethra 5 distal to corpora cavernosa
(b) Mattress sutures through the entire thickness of corpora cavernosa
(α) Two horizontal
(β) Four vertical } (Med Ann 1938)
(c) Split the urethral end and suture the halves to the skin
Post. treat (1) Tie in catheter
(2) Vaseline dressings

(3) TOTAL AMPUTATION OF THE PENIS
Ind Carcinoma penis
Contraind (a) Kidney inefficiency
(b) Local inoperability
(c) Low general condition
Anæsth (1) General
(2) Spinal
Tech (1) Lithotomy position
With bougie in the urethra
(2) Incision
(a) Basal circle
↓ (b) Median scrotal
↓ (c) Transverse perineal

(3) Exposure of bulb and crura.
: Division of bulbo and ischio cavernosi
(4) Isolation of bulb
(5) Cutting the urethra.
: *1 5" distal to the bulb*
(6) Ligature of vessels
. Of the bulb and crura
(7) Separation and cutting of the crura
(8) Division of dorsal vein
(9) Separation and removal of the penis
(10) Suture of the urethra
: To the perineal skin
(11) Suture of the incision.
• With adequate drainage

Addl steps • (12) Removal of testes and scrotum
or (12) Removal of scrotum + orchioplasty into thighs
+ (13) Bilateral removal of inguinal glands
Method (*a*) Along with primary operation
(*b*) *As a second stage*
Incisions (*a*) Lateral extensions from basal circle
or (*b*) Vertical inguinal (Med Ann 1939)
Points. Save (*a*) Femoral vein
(*b*) Femoral artery
(*c*) Femoral nerve

Post. compl: (1) Shock
(2) Hæmorrhage
(3) *Anuria → uræmia*
(4) *Ascending urinary sepsis*
(5) Cellulitis or gangrene of the wound
(6) Delirium nervosum
(7) Chest complications
(8) Heart complications

Sequelæ. (*a*) Retraction and stricture of urethral orifice
(*b*) *Glandular recurrence*
(*c*) *Secondary hæmorrhage*.
From femoral vessels
(*d*) Œdema of the legs

(4) OPERATION FOR IMPOTENCE
. Plication of perineal muscles by fascia lata
(*a*) Bulbo-cavernosus
(*b*) Ischio-cavernosi

(B) THE SCROTUM

(I) CONGENITAL ABNORMALITIES:

(1) BIFID SCROTUM

Associated: (*a*) Hypospadias perinealis
(*b*) Incomplete descent of the testes
Clinic: Pseudo hermaphroditism

(2) SCROTAL DERMOID

Clinic **Midline** pilo sebaceous cyst
Compl Infection
Diff diag (*a*) Sebaceous cysts
(*b*) Scrotal abscess

Treat Excision

(II) TRAUMA

(1) CONTUSION

In association with contusion of testes
Etio Squeezes and falls

(2) LACERATION Avulsion

Etio (*a*) Mill accidents
(*b*) Bull gore
Compl (*a*) **Prolapse testis**
↓ (*b*) Hernia testis
Treat (*a*) Debridement
↓ (*b*) Plastic operation
(α) Skin grafting
or (β) Orchidopexy

(3) HÆMATOMA

Etio **Post operative**
(*a*) Herniotomy
(*b*) Hydrocele excision of the tunica
Clinic *Swelling within 48 hours after operation*
Compl (*a*) Sepsis
(*b*) Fibrosis
Treat (A) Preventive
(*a*) Good hæmostasis
(*b*) Tight bandage + elevation
(α) *Place over a leucoplast bridge*
or (β) *Suture scrotum to pubis*
(B) Curative
(*a*) Conservative pot iodide
(*b*) **Syringe out the clot**
(See under Tunica Vaginalis)
(*c*) Incise and turn out the clot

(III) INFECTION

(1) SCROTAL ECZEMA

Etio (*a*) **Friction** Large scrotal swellings
(*b*) **Urinary irritation**
(α) Dribbling
(β) Large scrotal swelling
(γ) Buried or short penis
Treat (*a*) Treat the etiology

(b) Protection of scrotal skin:
: Vaseline or boric ointment
(c) Treat the eczema

(2) SCROTAL ERYSIPELAS:

Etio: Contagion from:
(a) Other parts
(b) Other patients

Path: Streptococcal cutaneous lymphangitis with pronounced general toxæmia

Clinic: (1) Acute and rapidly spreading, red, inflammatory, œdematous swelling of the scrotal skin with raised borders and vesication
(2) Local itching + smarting + tenderness
(3) Regional lymphadenitis
(4) Severe constitutional signs

Diff. diag: (a) Eczema or intertrigo scrotum
(b) Cellulitis scrotum

Compl: (a) Cellulitis scrotum
(b) Gangrene scrotum
(c) Septicæmia

Treat: (1) **Sulphonamides**
(2) Anti-streptococcal serum
(3) Local ichthyol ointment

(3) SCROTAL CELLULITIS:

Etio: (a) **Extravasation of urine:**
(α) Rupture bulbous urethra
(β) Rupture peri urethral abscess
(b) **Filariasis**: Streptococcal
(c) Local septic focus: boil

Clinic: (1) Acutely spreading, œdematous, inflammatory swelling
(2) Septic toxæmia

Special: (a) Extravasation of urine:
(α) *Non entrance into thighs*
(β) Abrupt perineal limitation
(γ) Abdominal subcutaneous ascent
(b) Filariasis: other filarial stigmata
(α) Elephantiasis
(β) Inguinal lymphadenitis

Compl: (1) **Gangrene** scrotum
(2) **Septicæmia**

Treat: (A) **Local:**
(a) Fomentations: hip baths
↓(b) Free incisions
↓(c) Hypertonic: baths, irrigations, packs

(B) **General** Antiseptic
Sulphonamides antistreptococcal

(C) **Causal**
Treat the etiology

(4) IDIOPATHIC SCROTAL GANGRENE
Syn Fournier's gangrene
Clinic (*a*) Progressively spreading gangrene
↓ (*b*) Exposure of testes
Which are not affected
Treat (*a*) Incisions cauterisation excision
(*b*) Irrigations (α) Hydrogen peroxide
(β) Pot permanganate
(*c*) General antiseptics
Sulphonamides
(*d*) Specific
Anti gas gangrene serum

(IV) SPECIFIC INFECTIONS

(1) TUBERCULOSIS
Etio **Tuberculous epididymitis**
Path (*a*) Tubercle formation
↓ (*b*) Fibrosis
↓ (*c*) Caseation
↓ (*d*) Secondary infection
↓ (*e*) Sinus formation
Clinic (*a*) Cold abscess or **discharging sinus**
(α) **Postero inferior** angle
(β) Anterior
In anterior inversion of epididymis
(*b*) **Adherent epididymis**
Nodular craggy
Treat (*a*) Scraping
(*b*) **Excision**
Epididymis with sinus track or orchidectomy

(2) SYPHILIS
(A) **Chancre**
(B) **Secondary condylomata**
(C) **Gumma testis**
(*a*) Enlarged testis
↓ (*b*) Adherent testis
Anterior aspect
↓ (*c*) Gummatous abscess
↓ (*d*) Gummatous ulcer
(α) Anterior aspect
(β) Round
(γ) Punched out sharp margins
(δ) Wash leather slough
(*u*) Adherent testis

Treatment: (a) Pot. iodide
(b) Anti syphilitic

(3) FILARIASIS:
Syn: **Elephantiasis scrotum** (See page 1857)
Etio: (a) *Filariasis*
(b) Sloughed or excised lymph glands
Path: Indurative fibrous hypertrophy of skin and subcutaneous tissues of the scrotum and penis
Clinic: (A) **Passive type:**
: Slow induration
(B) **Lymphatic type:**
: Soft, vascular, œdematous
(C) **Inflammatory type:**
: Recurrent cellulitis with fever
Associated: (1) Elephantiasis elsewhere:
: Leg, penis, hand
(2) Filarial lymphatic abscess: inguinal
(3) Filarial chylocele
Compl: (a) **Distortion** of penis
(b) Enormous **swelling**
(c) Recurrent cellulitis
(d) Eczema or irritation skin
Treat: (a) **Excision** of the skin and subcutaneous tissues of the scrotum and penis
+(b) **Orchidopexy:**
: Inner sides of the thighs
+(c) Penis:
(α) **Skin-graft**
or (β) Cover it with preputial muc. membrane

(V) SCROTAL CYSTS:

(1) SEBACEOUS CYST.
Clinic: (a) Subdermal
(b) **Multiple**
(c) Scattered. **anywhere**
(d) **Adherent** to skin at one black spot
(e) Sebaceous material
Compl: Infection
Treat: Excision

(2) DERMOID:
Clinic: (a) Subcutaneous
(b) Non adherent to skin
(c) Single
(d) **Midline**
(e) Sebaceous material + **hair**

(VI) SCROTAL NEW GROWTHS:

(1) PAPILLOMATA:
(a) Warts
(b) Condylomata

(IX) SCROTAL CYSTIC SWELLINGS:

(A) *Skin and subcutaneous tissues*

(1) **Abscess:**
Path (*a*) Primary
(*b*) Secondary pointing abscess
Clinic Inflammation + fluctuation + fever

(2) **Sebaceous cyst:** (See page 1855)
(*a*) Multiple
(*b*) Scattered
(*c*) Non inflammatory
(*d*) Tense, globular, mouldable
(*e*) Adherent to skin
: At one black spot

(3) **Dermoid** (See page 1855)
(*a*) Single
(*b*) Midline
(*c*) Non adherent to skin
(*d*) Sebaceous material + hair

(B) *Underlying cystic swellings*

(*a*) **Recent hæmatoma**

(*b*) **Tunica vaginalis:**
(1) Hydrocele
(2) Recent hæmatocele
(3) Chylocele
(4) Pyocele

(*c*) **Epididymis:**
(1) Cysts
(2) Cold abscess

(*d*) **Testis:** Fluctuating gumma

(*e*) **Spermatic cord:**
(1) Encysted hydrocele
(2) Hydrocele of hernial sac

(X) SOLID SCROTAL TUMOURS:

(1) **Secondary syphilis:**

(A) **Papules:**
(*a*) Flat dusky papule
(*b*) Fine desquamation of skin

(B) **Mucous patches:**
(*a*) Moist surface
(*b*) Milk white appearance
(*c*) Other signs of syphilis

(2) **Prurigo:**
(*a*) Small, firm, red papule
(*b*) Pigmented skin
(*c*) Intolerable itching

(3) **Epithelioma:**
 (a) Chronic warty growth
 (b) Infiltration and induration
 (c) Progressive lesion
 (d) Inguinal secondaries
 (e) Occupation
 (f) Age: past 40

(4) **Lipoma:**
 (a) Multilobular
 (b) Soft
 (c) Well defined edges, slipping under the finger
 (d) Mobile
 (e) Subcutaneous
 (f) Along the cord

XI) ULCERS OF THE SCROTUM:

(1) **Soft chancre:** (See page 1842)

(2) **Hard chancre:** (See page 1841)

(3) **Epithelioma:** (See above)
 (a) Chronic
 (b) Slow but steady progress
 (c) Induration
 (d) Infiltration
 (e) Eversion
 (f) Friability
 (g) Inguinal secondaries

(4) **Gummatous:** (See page 1854)
 (a) Anterior aspect
 (b) Round, punched out
 (c) Wash leather slough
 (d) Protruding or adherent testis

(5) **Tuberculous:** (See page 1854)
 (a) Posterior aspect
 (b) Sinus with fibrosis around
 (c) Adherent craggy epididymis
 (d) Caseous discharge

(6) **Fungating malignancy:**
 : Irregular, protruding mass of testis

(C) IMPORTANT POINTS

(1) 95% of pseudo hermaphrodites are males.

(2) *Every case of phimosis, look for:*
 (a) *Preputial adhesions*
 (b) *Pin point meatus*
 (c) *Hernia*
 (d) *Prolapse ani.*

(3) Infections in different lesions
  (a) Hard chancre Treponema pallidum
  (b) *Soft chancre Ducrey bacillus*
  (c) Granuloma Leishman Donovan

(4) In a case of priapism, do not forget to examine the spleen for leukæmic enlargement

(5) If erection has persisted for two days, thrombosis exists in the corpora and the use of sedatives, narcotics, hypnotics and cooling lotions are absolutely useless

(6) In carcinoma penis, radium for primary and surgical excision for the secondary glands.

(7) When a circumcision wound in an adult does not heal within a reasonable time, the lesion should be regarded as potentially malignant and treated accordingly

(8) *The chief post operative complication of amputation penis is stricture urethra*

(9) *In circumcision*
  (a) *Do not remove too much or too less skin*
  (b) *Beware of preputial adhesions to glans*
  (c) *Keep a collar of muc mem around the corona glandis*
  (d) *Secure good hæmostasis*
    (α) Three in one frænal stitch
    (β) Dorsal vein
    (γ) Dorsal arteries
  (e) *Secure good muco cutaneous apposition*

(10) *In circumcision*
  (a) *Never perform it in presence of acute sepsis*
  (b) *Open method is better than clamp method*

(11) *Most common complications of phimosis*
  (a) *Balanitis*
  (b) *Paraphimosis*
  (c) *Urinary obstruction*
  (d) *Urinary calculus*
  (e) *Strain syndrome*

(12) *Never do hernia or prolapse rectum in the presence of phimosis*

(13) Paraphimosis is common in
  (a) Children
  (b) First coitus.

(14) Chief indications for circumcision
  (a) Custom
  (b) Child within 2 weeks
  (c) Presence of complications
  (d) Marriage
  (e) Any preputial focus
  (f) Hasty ejaculation

(15) Chordee or priapism is common in:
(a) Gonorrhœal urethritis
(b) Nervous diseases
(c) Thrombosis
(d) Post operative.

(16) *Do not forget to give sedatives after circumcision.*

(17) *Treatment of balanitis is dorsal slit with hypertonic bath.*

(18) *Common ulcers on penis:*
(a) *Hard chancre: induration*
(b) *Soft chancre: multiple*
(c) *Carcinomatous*

(19) *Most common etiological factor of cancer penis is phimosis.*

(20) Clinical varieties of carcinoma penis:
(a) Warty
(b) Ulcerous
(c) Fistulous
(d) Balanitic.

(21) *Causes of death in carcinoma penis:*
(a) *Anuria with uræmia*
(b) *Urinary sepsis*
(c) *Secondary hæmorrhage:*
: Femoral artery or vein

(22) Amputation penis:
(a) Good stump possible:
: Partial amputation
(b) Too short stump:
. Total amputation

(23) *Most common post operative complications after amputation penis are:*
(a) Hæmorrhage
(b) *Anuria*
(c) Urinary sepsis
(d) *Wound sepsis*
(e) *Stricture urethra*
(f) *Decubitus*

(24) There is never any incontinence in complete amputation penis.

(25) *Gangrenous patch on the glans penis is inevitably an harbinger of death.*

(26) Vertical incisions for removal of inguinal glands have three advantages:
(a) Excellent exposure
(b) Parallel to vessels
(c) No pocketing. (Med. Ann. 1939)

(27) Johnson's *three vertical incisions* radical operation for carcinoma penis.

(Med. Ann. 1939)

(28) *In a young patient in whom increased frequency, pyuria and penile pain are present, a search should be made for any tuberculous focus* especially in testis, prostate, vesicles or kidneys and T B bacilli in urine.

(29) *Sequelæ of different lesions*
- (a) *Hard chancre, no scar*
- (b) *Soft chancre, depressed scar*
- (c) *Gummatous ulcer pigmented, thin, ill nourished scar*

(30) Most common growths of the scrotum.
- (a) Condylomata
- (b) Sebaceous cysts

(31) Most common scrotal inflammation urine extravasation

(32) Penile shaft and testis are entirely unaffected in elephantiasis of the scrotum

(33) *Any scrotal abscess on the anterior aspect, suspect a gumma*

(34) *Posterior sinus, fibrosis or adhesion to epididymis is most commonly due to tuberculosis*

(35) *Hæmatoma of the scrotum is the most common post operative complication after operations on inguinal or scrotal regions*

(36) *A stitch uniting the scrotal bottom to mons pubis at the end of an inguinal or scrotal operation, is a good prophylactic against post operative scrotal hæmatoma*

THE ENDOCRINES

CHAPTER I

THE PITUITARY

(1) ANATOMY.

Site (a) Suspended at the base of the brain, from the floor of the third ventricle, by the infundibulum

(b) Lies in the pituitary fossa of the sella turcica of the sphenoid bone, in the middle fossa of the skull

Dimensions. 13 mm × 8 mm.

Structure (A) Anterior lobe:

Embryo: From ectodermal pharyngeal pouch

Parts: (a) *Pars anterior*

Histology: Cord like alveoli of granular cells:

(α) Chromophobe.

: Cause hypopituitarism

(β) Chromophil:

(1) Eosinophil:

: Cause hyperpituitarism

(2) Basophil:

: Cause Cushing's syndrome

(b) *Intra glandular cleft*:

. Remnant of the Rathke's pouch

(c) *Pars intermedia*:

Histology. Granular basophil cells:

: With colloid material

(B) Posterior lobe *Pars nervosa*

Embryology. From neural ectoderm

Histology Neurolgial cells and fibres

(C) Pars Tuberalis:

Embryo: From oral ectoderm

Histology. Surrounds the infundibulum

: Very vascular

Relations: (A) Inferior:

: Sphenoidal air sinuses

(B) Lateral.

(a) Cavernous sinuses: right and left

with: (α) Nerves:

: 3rd, 4th, 5th, 6th

(β) Internal carotid artery

(b) Intercavernous sinuses: ant. and post.

(C) Superior

(a) Diaphragma sellæ

(b) Optic chaisma and tract

(c) Floor of the third ventricle

(d) Clinoid processes

(2) PHYSIOLOGY

Functions (A) Pars anterior

(a) Skeletal growth

(b) Sexual development

(c) Mental development

(B) Pars intermedia

(a) Metabolism

(α) Metabolic rate

(β) Glycosuria

(γ) Deposition of fat

(b) Regulation of urine

(c) Stimulation of plain muscle

(d) (Regulation of melanophores in frogs)

(C) Pars nervosa

Vehicle of pars intermedia

(3) PATHOLOGY Dyspituitarism

(1) **Anterior lobe over activity**

Cause

Path

Clinic (

(b) **Acromegaly** After epiphysial union

(2) **Anterior lobe deficiency**

Cause (a) Chromophobe hyperplasia

(b) Anterior lobe necrosis

(c) Suprasellar tumours

Path Anterior hypopituitarism

Clinic (a) **Infantilism**

(α) Delay in genital maturity

(β) Delay in secondary sex characters

(b) **Simmond s syndrome**

(3) **Posterior lobe deficiency**

Cause (a) Chromophobe hyperplasia

(b) Suprasellar tumours

Clinic (a) **Obesity**

(b) Increased sugar tolerance

(4) **Combined antero posterior lobe deficiency**

Cause Suprasellar tumours

Clinic **Frohlich syndrome**

(4) CLINIC

(1) *Hyperpituitarism*

Cause Eosinophil hyperplasia

Types (A) **Gigantism**

Ætio Hyperpituitarism before epiphysial union

Types (a) Pituitary acidophilism

Late spurt of growth

(b) Pituitary basophilism

Syn Cushing s syndrom

(B) **Acromegaly:**
Etio. Hyperpituitarism after epiphysial union
Path: (1) Abnormal sensitiveness to stresses
↓ (2) Symmetrical osseous hypertrophy
+ (3) Connective tissue hyperplasia
Clinic: (a) Skeletal changes. *'Gorilla type'*
(1) Lower jaw: prognathous
(2) Hands & feet. large and coarse
(3) Spine: kyphosis
(b) Connective tissue hyperplasia:
: Coarse face
(c) Increased sexual excitement
(d) Glycosuria:
: Relieved by insulin
(e) Profuse perspiration

Clinic: (a) Dwarfism
(b) Infantilism:
(α) Skeletal
(β) Sexual
(c) Sexual depression
(d) Adiposity
(e) Depression of metabolic rate
(f) Cutaneous changes:
(α) Alopecia
(β) Wrinkling
(g) Mental backwardness

Syndrome: (A) **Simmond's syndrome:**
Cause: Anterior lobe deficiency
Clinic: (a) Hypogonadism
(b) Alopecia
(c) Anorexia + achlorhydria
(d) *Cachexia* + anæmia

(B) **Frohlich's syndrome:**
Syn.
Path:
Clinic:
plastic genitals:
(a) *Sex infantilism*
(b) *Obesity*
(c) Lowered metabolism
(d) Increased sugar tolerance
(e) Local and general pressure signs

(C) **Lorain's syndrome.**
Clinic: (a) Attractive graceful children
(b) *Appearance of childhood in adult life*

(2) PHYSIOLOGY

Functions (A) Pars anterior
- (a) Skeletal growth
- (b) Sexual development
- (c) Mental development

(B) Pars intermedia
- (a) Metabolism
  - (α) Metabolic rate
  - (β) Glycosuria
  - (γ) Deposition of fat
- (b) Regulation of urine
- (c) Stimulation of plain muscle
- (d) (Regulation of melanophores in frogs)

(C) Pars nervosa
- Vehicle of pars intermedia

(3) PATHOLOGY **Dyspituitarism**

(1) **Anterior lobe over activity**

Cause

Path

Clinic ([illegible]
- (b) **Acromegaly** After epiphysial union

(2) **Anterior lobe deficiency**

Cause (a) Chromophobe hyperplasia
- (b) Anterior lobe necrosis
- (c) Suprasellar tumours

Path Anterior hypopituitarism

Clinic (a) **Infantilism**
- (α) Delay in genital maturity
- (β) Delay in secondary sex characters
- (b) **Simmond s syndrome**

(3) **Posterior lobe deficiency**

Cause (a) Chromophobe hyperplasia
- (b) Suprasellar tumours

Clinic (a) **Obesity**
- (b) Increased sugar tolerance

(4) **Combined antero posterior lobe deficiency**

Cause Suprasellar tumours

Clinic **Frohlich syndrome**

(4) CLINIC

(1) *Hyperpituitarism*

Cause Eosinophil hyperplasia

Types (A) **Gigantism**

Etio Hyperpituitarism before epiphysial union

Types (a) Pituitary acidophilism
- Late spurt of growth
- (b) Pituitary basophilism
- Syn Cushing s syndrome

(B) **Acromegaly:**
Etio: Hyperpituitarism after epiphysial union
Path: (1) Abnormal sensitiveness to stresses
↓ (2) Symmetrical osseous hypertrophy
+ (3) [illegible]
Clinic: (a) [illegible]
[illegible]
(2) Hands & feet: large and coarse
(3) Spine: kyphosis
(b) Connective tissue hyperplasia:
: Coarse face
(c) Increased sexual excitement
(d) Glycosuria:
: Relieved by insulin
(e) Profuse perspiration

(2) *Hypo pituitarism*:
Cause: (a) Chromophobe hyperplasia
(b) Suprasellar tumours
Clinic: (a) Dwarfism
(b) Infantilism:
(α) Skeletal
(β) Sexual
(c) Sexual depression
(d) Adiposity
(e) Depression of metabolic rate
(f) Cutaneous changes:
(α) Alopecia
(β) Wrinkling
(g) Mental backwardness

Syndrome: (A) **Simmond's syndrome:**
Cause: Anterior lobe deficiency
Clinic: (a) Hypogonadism
(b) Alopecia
(c) Anorexia + achlorhydria
(d) *Cachexia* + anæmia

(B) **Frohlich's syndrome:**
Syn.: Dystrophia adiposo genitalis
Path: Disturbance of all functions of pituitary
Clinic: Stunted, fat, idiotic children with hypoplastic genitals.
(a) *Sex infantilism*
(b) *Obesity*
(c) Lowered metabolism
(d) Increased sugar tolerance
(e) Local and general pressure signs

(C) **Lorain's syndrome.**
Clinic: (a) Attractive graceful children
(b) *Appearance of childhood in adult life*

(2) PHYSIOLOGY

Functions (A) Pars anterior
- (a) Skeletal growth
- (b) Sexual development
- (c) Mental development

(B) Pars intermedia
- (a) Metabolism
  - (α) Metabolic rate
  - (β) Glycosuria
  - (γ) Deposition of fat
- (b) Regulation of urine
- (c) Stimulation of plain muscle
- (d) (Regulation of melanophores in frogs)

(C) Pars nervosa
Vehicle of pars intermedia

(3) PATHOLOGY Dyspituitarism

(1) Anterior lobe over activity:

Cause [illegible]
Path [illegible]
Clinic (a) [illegible]
(b) **Acromegaly:** After epiphysial union

(2) Anterior lobe deficiency:

Cause (a) Chromophobe hyperplasia
(b) Anterior lobe necrosis
(c) Suprasellar tumours
Path Anterior hypopituitarism
Clinic (a) **Infantilism**
- (α) Delay in genital maturity
- (β) Delay in secondary sex characters

(b) **Simmond's syndrome**

(3) Posterior lobe deficiency:

Cause (a) Chromophobe hyperplasia
(b) Suprasellar tumours
Clinic (a) **Obesity**
(b) Increased sugar tolerance

(4) Combined antero posterior lobe deficiency:

Cause Suprasellar tumours
Clinic **Frohlich syndrome**

(4) CLINIC

(1) *Hyperpituitarism*

Cause Eosinophil hyperplasia
Types (A) **Gigantism:**
Etio Hyperpituitarism before epiphysial union
Types (a) Pituitary acidophilism
Late spurt of growth
(b) Pituitary basophilism:
Syn Cushing's syndrome

(B) **Acromegaly:**

Etio Hyperpituitarism after epiphysial union

Path (1) Abnormal sensitiveness to stresses

↓ (2) Symmetrical osseous hypertrophy

\+ (3) Connective tissue hyperplasia

Clinic (*a*) Skeletal changes *'Gorilla type'*

(1) Lower jaw prognathous

(2) Hands & feet large and coarse

(3) Spine kyphosis

(*b*) Connective tissue hyperplasia

Coarse face

(*c*) Increased sexual excitement

(*d*) Glycosuria

Relieved by insulin

(*e*) Profuse perspiration

(2) *Hypo pituitarism*

Cause (*a*) Chromophobe hyperplasia

(*b*) Suprasellar tumours

Clinic (*a*) Dwarfism

(*b*) Infantilism

(α) Skeletal

(β) Sexual

(*c*) Sexual depression

(*d*) Adiposity

(*e*) Depression of metabolic rate

(*f*) Cutaneous changes

(α) Alopecia

(β) Wrinkling

(*g*) Mental backwardness

Syndrome. (A) **Simmond's syndrome:**

Cause Anterior lobe deficiency

Clinic (*a*) Hypogonadism

(*b*) Alopecia

(c) Anorexia + achlorhydria

(*d*) *Cachexia* + anæmia

(B) **Frohlich's syndrome:**

Syn. Dystrophia adiposo genitalis

Path Disturbance of all functions of pituitary

Clinic Stunted, fat idiotic children with hypoplastic genitals

(*a*) *Sex infantilism*

(*b*) *Obesity*

(*c*) Lowered metabolism

(*d*) Increased sugar tolerance

(*e*) Local and general pressure signs

(C) **Lorain's syndrome**

Clinic (*a*) Attractive graceful children

(*b*) *Appearance of childhood in adult life*

(α) Diminished growth
(β) Sex infantilism
(γ) Fine hairless skin
(D) Brissaud's syndrome:
Clinic (a) Obesity chubby face
(b) *Somnolence*
(c) Defective growth of hair
(E) Oppenheim's syndrome
Syn *Pseudo-tabes pituitaria*
Clinic Subacute degeneration of the cord
Path Defective anterior lobe

(5) TUMOURS:

: Classification of pituitary tumours

(A) *Intra sellar tumours*

(1) *Adenomata.*

(A) **Chromophobe adenomata:**
Etio Commonest
Age: 20 to 40
Clinic Hypopituitarism

(B) **Chromophil adenomata:**
Age. After 30
Types. (a) **Eosinophil adenoma**
Clinic Hyperpituitarism
(b) **Basophil adenoma:**
Clinic: Cushing's syndrome

(C) **Mixed or transitional adenomata:**
Age 20 to 40
Clinic Hyper + hypo pituitarism

(2) *Adeno carcinomata:*
Age. After 45
Path. (a) Primary chromophobes
(b) Secondaries liver
Clinic: (a) Primary infiltration signs
(b) Enlarged liver

(3) *Cranio pharyngiomata*

(B) *Supra sellar tumours*

(1) *Cranio pharyngiomata*
Syn: Adamantinomata
Age: 10–20 years
Path: Slow cysts
Origin: *Rathke's pouch*
Clinic: (a) Pressure signs:
(α) Local
(β) General intracranial
(b) Hypopituitarism

(2) *Endotheliomata*

(3) *Basal meningiomata*
(4) *Aneurysm*

Clinical syndrome of pituitary tumours:

(A) Constitutional: Dyspituitarism

(1) Hyper pituitarism
(2) Hypo pituitarism
(3) Mixed

(B) Pressure syndrome:

(a) Local pressure:

(α) *Visual changes:*
(1) Optic chaisma:
: Bitemporal hemianopia
(2) Optic nerve
: Unilateral blindness
(3) Optic tract:
: Homonymous hemianopia
(4) Oculomotor:
· Diplopia and palsy
(5) Cavernous sinus:
: Proptosis with engorged lids

(β) *Brain changes:*
(1) Anterior temporal lobe:
: Uncinate fits of smell
(2) Foramen of Monro:
: Hydrocephalus
(3) Floor of the third ventricle·
: Persistent drowsiness
(4) Frontal lobes:
: Slow cerebration

(γ) *Basal syndrome:*
(1) Diabetes insipidus
(2) Glycosuria
(3) Obesity
(4) Somnolence
(5) Hyperthermia

(δ) *Changes in sella turcica:*
(1) Deep ballooning
(2) Clinoid erosion

(b) General intra-cranial tension:

(1) Headache
(2) Vomiting
(3) Papillœdema → optic neuritis
(4) Irritability → slow cerebration
(5) Bradycardia
(6) Subnormal temperature

(I) ADENOMATA

(1) **Chromophobe adenoma**·

- Etio Commonest pituitary growth
- Age Between 20 and 40
- Clinic (A) *Local pressure group*
  - (a) Visual signs
    - (1) Choked disc
    - (2) Optic atrophy
    - (3) Bitemporal hemianopia
  - (b) Large sella turcica
  - (c) Raised intra cranial pressure
- (B) *Hypo pituitarism*
  - (a) *Infantile type*
    - (1) Local pressure signs
    - (2) Sexual infantilism
    - (3) Skeletal infantilism
    - (4) Adiposity
    - (5) Feminine configuration
  - (b) *Adult type*
    - (α) *Adiposo genital*
      - Etio Most common
      - Age 20 to 60
      - Sex Equal
      - Clinic (1) Local pressure signs
        - (2) Headache & somnolence
        - (3) Adiposity
        - (4) Sexual depression
        - With female configuration
        - (5) Low metabolism
        - With high sugar tolerance
    - (β) *Atrophic*
      - Clinic (1) Local pressure signs
        - (2) Senile configuration

(2) **Chromophil adenoma**

(A) **Eosinophil adenoma:**

- Age After 30
- Types (1) Before puberty
  - *Gigantism*
- (2) After puberty
  - *Acromegaly* (See page 1867)
- Clinic (a) Skeletal overgrowth
  - (1) Prominent jaw
  - (2) Large nose
  - (3) Spade hands and feet
  - (4) Hyperostosis
  - (5) Kyphosis
- (b) Me odermal hyperplasia

(c) Sexual excitement → depression
(d) Late local pressure signs

(B) **Basophil adenoma:**
Syn: Pituitary basophilism
Path. (a) Basophil adenoma
+ (b) Cortico adrenal hyperplasia
Clinic: *Cushing's syndrome*:
(a) Premature sexual maturity
(b) Rapidly developing obesity:
· Face, neck and trunk
(c) Hypertrichosis:
Trunk, face and limbs
(d) Dry dusky skin
(e) Vascular hypertension
(f) Glycosuria and hyperglycæmia

(3) **Mixed adenoma.**
Age: 20 to 30
Clinic. Mixed hyper- and hypo pituitarism

(II) ADENOCARCINOMATA.
Age: After 45 years
Path: (a) Chromophobe cells in irregular groups
(b) Very vascular
(c) Cystic degeneration
(d) Local infiltrative destruction
(e) Metastases in liver
Clinic: Rapid local and general pressure syndrome

(III) SUPRA-SELLAR CYSTS:
Syn: (1) Cranio pharyngiomata
(2) Adamantinomata
Age: Between 10 and 20 years
Frequency: 5% of all pituitary tumours
Path: Congenital cystic tumours:
: From embryonic rests of Rathke's pouch
Morb anat: (a) Unilocular
or (b) Multilocular
+ (c) Contents.
(α) Fluid
(β) Calcified areas
(γ) Papillomas
Course: Slow cysts with gradual pressure on:
(a) Optic chaisma
(b) Infundibulum
(c) Third ventricle
Clinic: *Frohlich's syndrome:*
(a) Childhood
(b) Pressure signs:

(α) Local syndrome
  (1) Failing vision
  (2) Headache
  (3) Somnolence → drowsiness
(β) Brain changes (See page 1869)
(γ) Basal syndrome (See page 1869)
(δ) X Ray
  (1) Sellar deformity
    Clinoid erosion
  (2) Flocculent calcification
↓ (ν) General intracranial tension +
↓ (c) Hypo pituitarism
  (α) Adiposity
  (β) Sexual infantilism
  (γ) Metabolic changes
    (1) Diabetes insipidus
    (2) Low basal metabolism
    (3) High sugar tolerance

Differential Diagnosis between pituitary tumours

Adenoma	*Adamantinoma*
Age Above 20	Age Below 20
Early dyspituitarism	Late dyspituitarism
Late cranial signs	Early cranial signs
Sellar ballooning	Clinoid erosion
No calcification	Supra sellar calcification
No polyuria	Early polyuria
Late visual signs	Early visual signs

Diagnose a pituitary tumour from

(a) Basal meningioma
(b) Optic glioma
(c) Cerebellar tumours
  (α) Medullo blastoma
  (β) Ependymal tumour

Treatment of pituitary tumours

(I) Operative

Ind (1) Progressive impairment of vision
  (2) Intolerable headache

Tech (1) *Radical operation*

Routes (A) **Trans sphenoidal**

Ind (a) Adenomata
  (b) Intra-sellar tumours
  (c) Inferior tumours

Position Prone
Anæsth Ether by pharyngeal tube
Steps (a) Upper alveolo-labial fold incision
(b) Submucous resection of septum & Vomer
(c) Introduction of bivalve speculum
(d) Nibbling of
(α) Anterior wall of sphenoidal cells
↓ (β) Floor of the sella
(e) Scooping of the tumour
After treat Nasal plug for 24 hours

(B) Trans-frontal:

Ind Supra-sellar tumours
Position Supine
Steps (a) Frontal bone flap
(b) Tap the ventricle through dura
If the pressure is high
(c) Retraction of dura from the bone
(d) Incision of the dura
Along the sphenoidal ridge
(e) Retraction of frontal lobe
(f) Tapping of the cyst
(g) Delicate dissection of cyst wall
(h) Replacement of bone flap
(i) Closure
Save (a) Optic nerve
(b) *Optic chaisma*
(c) Ant. branch of int. carotid art.

(C) Trans temporal

Ind (a) Supra-sellar tumours
(b) Palliative decompression

(2) *Palliative decompression*
Tech (a) Subtemporal
In supra-sellar growths
(b) Sellar
In intra sellar growths
Ind (a) Failing vision
(b) Intolerable headache
+ (c) Inoperable tumour
(α) Completely
(β) Partially
(II) Deep X Ray therapy
Time (a) Pre-operative
(b) Post-operative
(c) Palliative
Routes (1) Temporal
(2) Frontal

IMPORTANT POINTS

(1) After the gliomas, pituitary tumours form the next largest group of intra cranial new growths.

(2) *Anatomy and physiology:*

- (a) Pars anterior. from Rathke's pouch
- (b) Pars intermedius· from Rathke's pouch
- (c) Pars posterior or nervosa· from brain
- (d) Pars tuberalis: from Rathke's pouch

- (a) *Pars anterior.*
  - (α) *Skeletal growth*
  - (β) *Sexual development*
  - (γ) *Mental development*
- (b) *Pars intermedius + pars nervosa:*
  - (α) *Regulation of metabolism:*
    - (1) *Metabolic rate*
    - (2) *Glycosuria*
    - (3) *Deposition of fat*
  - (β) *Regulation of urine flow:*
    : Diabetes insipidus
  - (γ) *Stimulation of plain muscles.*
    · Arterioles and uterus
  - (δ) *Regulation of melanophores.*

(3) *Pathology:*

- (A) *Hyperpituitarism*
  - (a) *In children. gigantism*
  - (b) *In adults· acromegaly*
- (B) *Hypo pituitarism:*
  - (a) *In children:*
    - (α) *Infantilism:*
      - (1) *Skeletal*
      - (2) *Sexual*
    - (β) *Obesity*
  - (b) *In adults:*
    - (α) *Sex depression*
    - (β) *Obesity*
    - (γ) *High carbohydrate tolerance*
- (C) *Additional signs of pituitary disorder:*
  - (a) *Diabetes insipidus*
  - (b) *Obesity.*

(4) *Growths of the pituitary:*

- (A) *Intra sellar growths:*
  - (a) *Chromophil adenoma:*
    - (1) *Eosinophil adenoma:*
      : Hyperpituitarism
    - (2) *Basophil adenoma:*
      : Cushing's syndrome

(b) *Chromophobe adenoma*
Hypo pituitarism
(c) *Mixed or transitional adenoma*
Hyper + hypo pituitarism
(B) *Supra sellar cysts*
Hypo pituitarism

(5) Growth defects are present in all cases of pituitarism in children

(6) *Tumours of the pituitary are of three kinds*
(A) *Inferior*
Epistaxis and post nasal discharge
(B) *Lateral*
Cavernous sinus pressure syndrome
(C) *Superior*
Optic chaisma and basal syndrome

(7) *Tumours of the pituitary are of two kinds*
(A) *Dys pituitarism → pressure effects*
Intra sellar growths
(B) *Pressure effects → dys pituitarism*
Supra sellar growths

(8) Pituitary tropic hormones
(a) Thyrotropic
(b) Gonadotropic
(c) Growth hormone
(d) Diabetogenic

(9) Growth endocrine regulation (including reproductive functions) and metabolism form the functional trinity of anterior pituitary lobe

(10) Whether an intra sellar pituitary tumour produces visual symptoms or not depends in a large degree on the size of the foramen in the diaphragma sellæ for infundibulum, if it is large tumour bulges up and causes early visual changes, if it is small, the tumour bulges down through the floor of the sella.

(11) *50% of pituitary tumours give rise to visual signs*

(12) *Compact classification of pituitary tumours*
(A) *Intra sellar tumours*
(1) *Adenomata*
(a) *Chromophobe*
Etio Commonest
Age 20–40
Clinic Hypo pituitarism
(b) *Chromophil*
Age After 30
Types (a) *Eosinophil*
Hyper pituitarism

(β) *Basophil*
Cushing s syndrome
(c) *Mixed or transitional*
Age 20–40
Clinic Hyper + hypo pituitarism
(2) *Adeno-carcinomata*
Age After 45
Path (a) Chromophobe
(b) Liver metastases
Clinic (a) Primary signs
(b) Enlarged liver
(B) *Supra sellar tumours cranio pharyngioma*
Syn Adamantinoma
Age 10–20 years
Origin Rathke s pouch
Path Slow cyst
Clinic (a) Pressure syndrome
(α) Local
(β) General intracranial
(b) Hypo-pituitarism
(13) *Clinical syndrome of pituitary tumours*
(1) *Dys pituitarism*
(A) *Hyper pituitarism*
(B) *Hypo pituitarism*
(C) *Basophilism*
(a) Hyper pituitarism
+ (b) Cortico adrenal syndrome
(2) *Pressure syndrome*
(A) *Local*
(a) Visual
(b) Cranial nerves
(c) Cavernous sinus
(d) Brain cortex
(B) *General intracranial*
(14) Tumour groups of pituitary
(1) Hyper pituitarism
Eosinophil adenomata
(2) Hypo pituitarism
(a) Chromophobe adenomata
(b) Supra sellar tumours
(3) Pituitary basophilism
Basophil adenomata.
(15) *In hypo pituitarism children fail to reach sex adolescence, adults lose sexual desire and potency*
(16) *Supra sellar congenital cysts are extremely rare above the age of 20* and give rise to irregular deformation of sella *Adenomata are rare below 20* and give rise to symmetrical sellar enlargement.

(17) Operation of choice for pituitary adenomas is by way of the trans sphenoidal approach

(18) Modern approach to supra sellar pituitary tumours is right sided trans frontal extra dural, usual procedure is incision of capsule and aspiration of contents

(19) *Flocculent areas of calcification are pathognomonic of supra sellar cysts*

(20) Clinical stages of pituitary tumours
  (a) Endocrine
  (b) Visual
  (c) Tumoral

(21) Hypo pituitarism in children
  (a) Growth defects
    Infantile skeleton
  (b) Bone development
    Retardation of ossification
  (c) Sexual infantilism
  (d) Mentality
    Bright and alert
  (e) Neighbourhood pressure syndrome

(22) Chromophobe adenoma is the commonest type of pituitary tumours and gives rise to hypo pituitarism

(23) Hyper pituitarism is always associated with eosinophil adenoma of the anterior lobe and gives rise to gigantism in children and acromegaly in adults

(24) *Different syndrome in pituitary disease*
  (1) *Frohlich s syndrome*
    Stunted fat, idiotic children with hypoplastic genitals
  (2) *Lorain s syndrome*
    (a) Attractive graceful children
    (b) Childish adults
  (3) *Brissaud s syndrome*
    Somnolent obese children
  (4) *Oppenheim s syndrome*
    Subacute degeneration of the cord
  (5) *Simmond s syndrome*
    Infantilism + anorexia + cachexia
  (6) *Cushing s syndrome*
    (a) Premature sexual maturity
    (b) Hyper trichosis
    (c) Obesity
    (d) Vascular hypertension
    (e) Diabetes

(25) In all, except late cases, amelioration of vision relief of head ache and improvement in mentality follow surgical procedures in pituitary tumours.

CHAPTER II

THE THYROID

(I) ANATOMY

Gross Two lateral lobes united by isthmus
Lying against upper trachea
(a) Arteries
(1) Superior thyroid upper pole
In relation to external laryngeal nerve
(2) Inferior thyroid middle of post surface
In relation to recurrent laryngeal nerve
(3) Thyroidea ima
(4) Accessory thyroids
(b) Veins
(1) Superior thyroid } -> Int. jug vein
(2) Middle thyroid }
(3) Inferior thyroid -> Left innominate vein
(4) Accessory thyroid
(c) Nerves in relation
(1) Recurrent laryngeal vocal cords
(2) External laryngeal cricothyroid
(3) Superior laryngeal inter arytenoids
(d) Capsules
(1) True glandular
(2) False pre tracheal fascial

Histology Lobules of spherical or oval vesicles lined by granular cubical or low columnar cells and occupied by iodine-containing colloid *thyroxin*, which is absorbed by lymphatics or blood stream
(A) Resting or storage phase
Excessive accumulation of colloid with flat cells
(B) Active or secretory phase
Diminution or absence of colloid with cubical cells

(II) PHYSIOLOGY

Control Thyrotropic hormone of ant pituitary
Secretion Thyroxine di iodo-tyrosine 65% iodine
. Average total amount is 5 6 mgm of iodine
Functions (1) Regulation of metabolic level
(2) Catalysation of body oxidations
(3) Neutralisation of toxins

(III) PATHOLOGY: *Varieties of goitre*

(1) Cretinoid goitre
(2) Physiological goitre
(3) Colloid or involutional goitre:
(a) Diffuse involutional

(b) **Nodular involutional:**
(α) **Diffuse nodular**
(β) **Local nodular:**
: Colloid adenoma

(4) **Toxic goitre:** *Thyrotoxicosis*
(A) **Primary toxic**
(B) **Secondary toxic:**
(a) **Early**
(b) **Late**
(C) **Complicating thyrotoxicosis**

(5) **New growths:**
(A) Benign:
(a) **Fœtal adenoma**
(b) **Papilloma**
(B) Malignant:
(a) **Carcinoma:**
(α) **Papilliferous** adeno carcinoma
(β) **Malignant adenoma:**
(1) **Metastasising**
(2) **Proliferating**
(γ) **Scirrhous**
(b) Sarcoma

(IV) CLINIC:

(1) Bilateral or unilateral pyramidal **tumor:**
Characters: (a) Symmetrical or asymmetrical
(b) Cystic or solid
(c) **Moving on deglutition**
Situation: (a) Low down in the neck
(b) Both sides of midline
(c) Both sides of trachea

(2) **Pressure syndrome:**
(a) Veins
(b) Nerves
(c) Trachea
(d) Œsophagus: rare

(3) ***Dys-thyroidism syndrome:***
(a) Hypo thyroidism
(b) Thyrotoxicosis

(V) CONGENITAL ABNORMALITIES:

(1) LINGUAL THYROID.
Site: Foramen cæcum at the **base of the tongue**
Time: Puberty
Clinic: Purple red globular swelling
Compl: (a) Hæmorrhage
(b) Degeneration
(c) Carcinoma
Treat: **Leave alone**

(2) THYRO GLOSSAL CYSTS AND SINUSES

Site Foramen cæcum to supra sternal notch

Types (A) *Thyro glossal cyst*

Time Childhood or adolescence

Site **Midline, infra hyoid**

Morb anat (a) Columnar epithelial lining

(b) Clear glairy or mucoid fluid contents

Compl (a) Inflammation

↓ (b) Suppuration

↓ (c) **Fistula** Median cervical

(B) *Thyro glossal fistula*

Etio (a) Suppurated thyro glossal cyst

(b) Partial excision of thyro glossal cyst

Clinic (a) **Median cervical fistula**

(α) Supra hyoid

(β) Infra hyoid

(b) Glairy or purulent discharge

(c) Fibrosis and contracture around

Treat **Complete excision of the whole tract**

(3) ABERRANT THYROID

Sites (a) **Along thyro glossal tract**

(b) In lines with the poles lateral side neck

(c) Mediastinum—(between trachea & œsophagus)

Compl (a) Athyrosis

After excision

(b) Papilliferous carcinoma

(c) Difficult diagnosis

Diff diag (a) **Enlarged lymph gland**

(b) Branchial cyst

(VI) INFLAMMATION

(1) **Acute thyroiditis**

Etio Acute infectious fevers

(2) **Chronic thyroiditis**

Types (A) Tuberculous

(α) Miliary

(β) Caseous

(γ) Sclerosing

(B) Syphilitic

Etio Congenital or acquired

Path Diffuse fibrosis

Clinic Hard, adherent moderately enlarged

(3) **Ligneous thyroiditis**

Syn (a) Woody thyroiditis

(b) Riedel's thyroiditis

(c) Iron struma

Etio Usually occurs in *young adults of both sexes*

Path : (a) Hyperplasia → diffuse fibrosis + degeneration
(b) Adhesions to surrounding structures :
: Infra-hyoid and sternomastoid muscles

Clinic : Painless, stony hard, asymmetrical swelling :
(a) Adherent to surroundings
(b) Pressure syndrome :
: No recurrent laryngeal paralysis

Diff. diag : (a) Malignant thyroid
(b) Actinomycosis
(c) Lymphadenoid goitre. (Hashimoto's disease) (See below)

Treat : (a) Partial resection (Hemi thyroidectomy)
(b) Radium

(4) Lymphadenoid Goitre :

Syn : Hashimoto's disease

Etio : Usually affects women about 40 or so

Path. Generalised symmetrical enlargement
: Soft, painless, no pressure symptoms
: Non infiltrating, no adhesions to surrounding structures
: No lymph node enlargement
: Sooner or later ends in myxœdema, because of destruction of gland by lymphocytes and fibrosis

Macroscope : Homogeneous, yellowish white gland, no vesicles

Microscopic : Diffuse infiltration with lymphocytes, even forming at places germ centres or lymph follicles
: No hyperplasia of thyroid tissue

Clinic : Like diffuse colloid goitre but enlargement moderate.
: May be signs of hypo thyroidism
: Radio sensitive

Diagnosis. Suspicion : (from above)
: Confirmed by Biopsy

Treatment : Nil
: Thyroid extract by mouth.
: When symptoms of hypo-thyroidism supervene

(VII) GOITRE : Enlargement of the thyroid

(A) CRETINOID GOITRE :

Syn : Compensatory goitre

Clinic : Goitre in cretins of average height

(B) PHYSIOLOGICAL GOITRE

Syn : **Hypertrophic goitre**

Def : **Temporary functional enlargement** of the thyroid due to increased mental and physical demands on it.

Etio. **Mental and physical crises:**
· Puberty, menstrual periods, pregnancy, lactation, climacteric, acute crisis (mental or physical)

Path Reaction to a physiological stimulus, of a gland **deficient in iodine**

Morb anat (1) Columnar epithelial proliferation
(2) Diminution of colloid

Clinic (*a*) Small, symmetrical, soft enlargement
(*b*) No pressure signs or symptoms
(*c*) Occasional slight thyrotoxicosis

Treat (*a*) Remove septic foci
(*b*) **Thyroid extract:** 1 gr B D
(*c*) Lugol's iodine 5 m in milk B D

Compl (1) Colloid or **involutional goitre**
(2) Thyrotoxicosis

(C) INVOLUTIONAL OR COLLOID GOITRE

Def Enlargement of thyroid due to
: Hyper-involution following hyperplasia

Types (1) **Diffuse involutional goitre**
(2) **Nodular involutional goitre:**
(*a*) **Local nodular: Colloid adenoma**
Single nodule
(*b*) **Diffuse nodular. Pudding goitre**
Studded multiple nodules

Etio (A) Endemic hilly and marshy districts
(B) Sporadic

Theories (1) Kocher earth and water
(2) McCarrison toxic infection
(3) **Iodine deficiency:**
Deficiency of iodine and vitamine A
(4) **Faulty intake** · Excess of
(*a*) Proteins, *fats and calcium*
(*b*) Cyanogen compounds cabbages
(*c*) Goitrigenous substances.
Calcium, boron, silica, organic acids
(5) Bad hygienic surroundings

Path (A) [illegible]

(*c*) Colloid accumulation

(B) *Nodular involutional*

Morb anat Circumscribed areas of involution·
Developed in a hyperplastic gland

Types (*a*) **Colloid type.**
(α) Colloid flat celled vesicles
↓ (β) Necrosis or hæmor or calcific.

(b) **Fœtal type:**
: Small cubical celled vesicles; cells packed in columns, ill developed acini with small thin colloid.

(c) **Intervening areas of hyperplasia**

Clinic (A) *Diffuse involutional*
(1) Hard, nodular, **irregular goitre**
(2) **Pressure syndrome:**
(a) Veins thorax, neck and face
Duskiness, dilatation, varicosity
(b) Trachea scabbard
. Respiratory difficulty
(c) Recurrent laryngeal nerve
(α) Brassy cough
(β) Altered voice
(3) ***Mild hypo-thyroidism:*** *Myxœdema*

(B) *Nodular involutional*
(1) **Circumscribed nodules ·**
Single or multiple
In normal or hypertrophied thyroid
(2) **Pressure syndrome:**
(a) *Trachea* In retro sternal goitre
(b) Veins
(c) Nerves

Compl. (1) *Hæmorrhage into the cyst*
Clinic (a) **Severe dyspnœa** and stridor
(b) Dilated superficial thoracic veins
(c) Thickening of the skin of the face
(d) Sleeping posture
(e) **Sudden increase in size**
Compl **Sudden respiratory crisis:**
In retro sternal goitres
(2) *Thyrotoxicosis*
· Early and late secondary

Treat · (1) Conservative
(a) Removal of septic foci tonsils
(b) Thyroid extract 1 gr B D
(c) Lugol's iodine
(2) Operative
Ind Deformity, pressure, thyrotoxicosis
Oper · (A) Diffuse involutional
Partial thyroidectomy:
(a) Ant. ⅔rds of each lobe
(b) Isthmus
(c) Retro-sternal extension

(B) Nodular involutional
(a) **Enucleation**
(b) **Resection-enucleation**
(α) Unilateral
(β) Bilateral

(D) TOXIC GOITRE THYROTOXICOSIS

Etio **Nervy females at adolescence or climacteric**

Age (a) Primary toxic
(α) Adolescence 18–35 years
(β) Any time in life acute crisis
(b) Early secondary toxic
Adults twenties
(c) Late secondary toxic
Climacteric
(d) **Rare before puberty and after 50**

Pred sp (1) **Emotional strain + nervous instability**
(2) Endocrine disturbances
Thyrotropic hormone of pituitary
(3) **Infection** Acute or chronic tonsillitis
(4) Heredity + X factor
(5) Other forms of goitre

Path factors (1) **Intensity of stimulation**
Excessive gradual
(2) **State of thyroid epithelium**
(A) **Primary toxic**
Response of the epith of *whole gland*
(B) **Secondary toxic**
Response of epith of *involuted gland*
(a) **Early secondary**
From early colloid thyroid
(b) **Late secondary**
From advanced colloid thyroid
(C) **Complicating thyrotoxicosis**
Secondary toxic syndrome supervening on simple goitre or new growth
(3) **Age and condition of body tissues**
Senility heart musculature

Morb anat (1) Columnar hyperplasia and hypertrophy
(a) Uniform and diffuse
In primary
(b) Scattered areas in colloid thyroid
In secondary
(2) Lymphocytic aggregation
(3) Disappearance of colloid
Crenated margins and vacuoles
(4) ++ vascularity

Clinic: (1) **Onset**
- (A) Primary
  - Insidious or abrupt at adolescence
- (B) Early secondary
  - Goitre precedes toxicosis by a few years
- (C) Late secondary
  - Goitre precedes heart syndrome by many years

(2) **First signs**.
- (*a*) Fatigue and *loss of weight*
- or (*b*) *Palpitations*
- or (*c*) Tremors or *nervousness*
- or (*d*) Exophthalmos
- or (*e*) Goitre

(3) **Goitre**
- (A) Primary toxicosis
  - *Smooth* or coarse, bilateral, symmetrical, vascular (pulsatile or bruit)
- (B) Early secondary toxicosis
  - *Irregular*, larger, bilateral
- (C) Late secondary toxicosis
  - Nodular or *cystic*

(4) **Exophthalmos**: Primary toxicosis

Etio
- (*a*) Present in primary toxicosis
- (*b*) Variable in early secondary
- (*c*) Absent in late secondary

Path
- (*a*) Contraction of Muller muscle
- (*b*) Venous engorgement
- (*c*) Deposition of fat
- (*d*) Lymphatic obstruction

Clinic
- (*a*) Von Graefe lagging of upper eyelid
- (*b*) Stellwag slow winking
- (*c*) Dalrymple wide palpebral interval
- (*d*) Mobius weak convergence
- (*e*) Joffroy smooth forehead
- (*f*) *Staring look*

(5) **Nervous syndrome:**

Sympathetic sensitisation
- (*a*) Nervousness, irritability, neurasthenia
- (*b*) *Fine tremors* tongue & hands

(6) **Cardio-vascular**: Late secondary toxicosis
- (*a*) *Tachycardia*
- (*b*) Extra systole
- (*c*) Auricular flutter or fibrillation
- (*d*) Heart failure

(7) **Metabolic syndrome**
- (*a*) Rise in metabolic rate
- (*b*) Voracious appetite

(c) *Loss of weight → emaciation*
(d) Diarrhœa
(e) Glycosuria
(f) Flushing and sweating

(8) **Course** Intermittent
Crises (a) Rapid pulse
(b) Persistent restlessness
(c) Mental symptoms
(d) Cachexia
(e) Pyrexia (may be Hyperpyrexia)

Variations in *secondary toxicosis* syndrome
(1) *Goitre marked and precedes toxicosis*
(2) *Exophthalmos absent*
(3) *Cardio vascular signs prominent*

Compl (1) Thyrotoxicosis crises
(2) **Heart failure**
(a) Toxæmic
(b) Congestive
(c) Embolic
(3) **Severe mental disturbances**
(4) **Extreme emaciation**
(5) **Glycosuria** Diabetes
(6) Skin complications
(7) Pruritus
(8) Coma

Clinic Bulbar paralysis affecting
Speech + deglutition + asthenia
Treat (a) Glucose 20-30 c cs. of 25% T D S
(b) Adrenaline 3 4 ampoules
(c) Lugol s iodine 10 m T D S.
(d) Prolan 200 units a day

Diff diag (1) **Nervous diseases**
Neurasthenia hysteria
(2) **Cardio vascular diseases**
Heart disease
(3) **Phthisis or diabetes**

Treat (A) **Conservative**
(a) *Remove septic foci*
No operation before thyroid is tackled
(b) *Mental and physical rest*
Give *bromides* luminal etc. if necessary
Removal to *quiet surroundings*
Sympathetic attitude assurance
Lugol s iodine
High carbohydrate diet esp *glucose*

(B) **Operative** (See under Operations)
Ind (*a*) Sequelæ of the disease
(*b*) Economic factor
Tech (1) **Ligature of thyroid arteries**
(*a*) Superior thyroid
(*b*) Inferior thyroid
(2) **Partial thyroidectomy**
7/8th of each lobe
(in one or more stages)

(C) Palliative
(1) Injection of boiling water
5 to 20 c cs after novocainisation
(2) Radiation
Ind (*a*) Preliminary to operation
(*b*) Post operative recurrence
Compl (*a*) Telangiectasis
(*b*) Aggravation of toxicity
(*c*) Burns of the skin
(*d*) Cachexia strumipriva
(*e*) Wide adhesions

(E) NEW GROWTHS OF THE THYROID

(1) FOETAL ADENOMA
Path Proliferation of follicular epithelium
(*a*) Anastomosing columns or cords of cells
(*b*) Circular follicles or tubules lined by cells
(*c*) Transitional forms
Clinic (*a*) Single round, encapsuled, local tumor
(*b*) Deformity
(*c*) Pressure syndrome
Respiratory difficulty
Compl (*a*) **Malignancy**
(*b*) **Hæmorrhage** → pressure syndrome
Especially in intra thoracic
(*c*) **Thyrotoxicosis**
(*d*) **Cyst formation**
(*e*) Calcification

(2) PAPILLOMA
Path Active papilliferous growth
Clinic Encapsuled local tumour
Compl (*a*) Malignancy
(*b*) Cyst formation

(3) CARCINOMA THYROID
Etio Women between 40 and 60
Precanc (1) Aberrant thyroid
(2) Adenomatous cyst nodular goitre
(3) Thyroid adenoma or papilloma

Types (A) **Papilliferous adeno-carcinoma:**
- Etio Aberrant thyroids
- Path Papillary growths into cystic spaces
- Clinic Slow growth
  - *Secondaries in local lymph glands*

(B) **Malignant adenoma**
- Etio (a) Most common
  - (b) Secondary to fœtal adenoma
- Path *Secondaries by blood stream.*
  - (a) **Bones**
  - (b) **Lungs**
- Types (a) **Metastasising adenoma**: Slow
  - (b) **Proliferating adenoma** Rapid

(C) **Scirrhous, spheroidal or medullary.**
- Spread (a) Local infiltration
  - (b) Lymph permeation

(D) **Epidermoid or squamous**

Clinic (A) Local syndrome
- Goitre with some abnormality

(B) Distant syndrome
- *Bone lesion in seniles*

(1) **Pre existing goitre:**
- With (a) **Local syndrome**
  - (1) Localised irregularity
  - (2) Localised induration
  - (3) *Increase in size*
  - (4) *Rapidity of growth*
- (b) **Infiltration syndrome**
  - (1) *Overstepping the capsule*
  - (2) Incorporation of neighbours

(2) **Regional syndrome**
- (a) Trachea
  - (α) *Respiratory embarrassment*
  - (β) Respiratory complications
- (b) Veins
  - *Œdema, duskiness, varicosity*
- (c) Nerves
  - (α) *Altered voice + brassy cough*
  - (β) Neuralgias
- (d) Œsophagus dysphagia

(3) **Metastatic syndrome**
- (a) Lymph *enlarged lymph nodes*
- (b) Blood *Bones* and lungs
  - Vertebræ, skull, long bones
  - Large, soft, pulsating tumours

(4) **Endocrine syndrome.**
- *Thyrotoxicosis*

Diff diag (1) Hæmorrhage in adenoma
(2) Woody thyroiditis
(3) Calcified nodule
(4) Carcinoma trachea

Treat (A) **Excision → deep x ray therapy.**
Excision of thyroid en bloc after ligation of all the vessels and excision of a portion of the int jugular vein on the side of greater infiltration The lymph nodes should also be excised 'en bloc if and when present
(B) **Radium** Collar or bomb

Death (1) Pressure syndrome respiratory
(2) *Respiratory catarrh*
(3) Hæmorrhage

(4) SARCOMA THYROID

(VIII) HYPO THYROIDISM

(1) CRETINISM

Def **Congenital hypo thyroidism**
Due to athyrosis or defective secretion

Etio (*a*) Sporadic
(*b*) Endemic

Path (*a*) Degenerated epithelium
(*b*) Scanty colloid
(*c*) Fibrosis
(*d*) Hyperplasia in cretinoid goitre

Clinic Various milestones in the course of the child s development are reached much later than normal

(A) ***Non goitrous cretins***
(*a*) **Mental deficiency** Idiocy
(*b*) **Facial expression**
Puffy bloated face with big tongue
(*c*) **Growth retardation** Dwarfism
(*d*) Sexual retardation
(*e*) Protuberant abdomen
(*f*) Skin dry, atrophic senile
(*g*) Constipation

(B) **Goitrous cretins**
(*a*) Signs less marked
\+ (*b*) Goitre

Treat (1) Thyroid medication
Thyroid extract 1 gr B D
(2) Thyroid implantation

(2) MYXŒDEMA

Def **Acquired hypo thyroidism** Due to
, Pathological or surgical deprivation of thyroid

Types: (A) Idiopathic
(B) Pathologic:
: Colloid goitre
(C) Post operative:
: Cachexia strumipriva

Etio: Females of 40–45

Clinic: (a) Mental dullness
(b) Sleepy, unintelligent face
(c) Decreased metabolism:
: Obesity
(d) Decreased sexuality
(e) Skin and subcutaneous tissues:
(α) Dry + rough + hairless
(β) Supra clavicular fatty pads

Treat (1) **Thyroid medication:**
(a) Thyroid extract
(b) Thyroxine
(2) **Thyroid implantation:** (Personal case)
Good result with goat's thyroid

(IX) OPERATIONS ON THYROID:

(I) THYROID ADENOMA:

Ind (1) Failure of medicinal treatment
(2) Deformity
(3) Steady increase in size
(4) Dyspnoea:
(a) Chronic and gradual
(b) Sudden crisis:
(α) Retro-sternal goitre
(β) Hæmorrhage into a cyst
(5) Pressure upon blood vessels
(6) Pressure upon recurrent nerve:
. Altered voice or dysphagia
(7) Toxic syndrome
(8) Pain
(9) Fear of malignancy

Operation: (1) Single small adenoma:
: Enucleation
(2) Single very large adenoma:
: Hemi thyroidectomy
(3) Multiple small scattered:
· Wedge resection: (Resection-enucleation)

Prep: Lugol's iodine

Anæsth: (a) Open or intra tracheal ether
(b) Local novocain

Oper. tech: (A) Enucleation:
(a) Kocher's collar incision
(b) Division of platysma
(c) Vertical separation of pre-tracheal muscles

(*d*) Division of fibrous sheath
(*e*) Incision in thyroid tissue
Till glistening capsule is seen
(*f*) Enucleate the adenoma
(*g*) Obliterate the cavity
By buried sutures
(*h*) Drainage for 24 hours
Ind (α) Large adenoma
(β) Toxic syndrome
(B) Hemi thyroidectomy
(1) Exposure of the thyroid
(2) Forward dislocation of the lobe
(3) Division of
(α) Middle thyroid vein
(β) Superior thyroid vessels
(γ) Inf thyroid vein
(4) Excise the thyroid tissue
Leave back a thin slice posteriorly
(5) Division of branches of inf thyroid artery
(6) Division at the isthmus
(7) Obliterating sutures
(8) Drain for 24 hours
(2) COLLOID GOITRE
Ind (1) Dyspnoea
(*a*) Causing discomfort
(*b*) Steadily progressive
(*c*) Interference with sleep
(*d*) Sudden severe crisis
(2) Multiple adenomata
(*a*) Failure of conservatism
\+ (*b*) Pressure syndrome
(3) Hyper thyroidism
(4) Deformity
Operation (A) Double wedge resection
(*a*) Exposure of the thyroid
(*b*) Dislocation of both lobes
(*c*) Division of isthmus
(*d*) Application of clamps in two rows
(*e*) Wedge resection between clamps
(*f*) Obliteration sutures
(*g*) Drain for 21 hours
(B) Thyroid decompression
Ind *Sudden grave respiratory crisis*
Hæmorrhage in retro-sternal goitre
Steps (1) Collar incision
(2) Division of pre tracheal muscles
(3) Division of pre tracheal fascia
(4) Forward dislocation of thyroid
(5) Extrusion or resection

After treat (a) Morphia
(b) Fluids
(c) Rectal
Lugol + saline + glucose
(C) Cyst-aspiration
Ind Sudden grave respiratory crisis

(3) THYROTOXICOSIS

Contraind (a) Very early stage first 6 months
(b) Crisis especially nervous

Ind (a) Sequelæ
(b) Economic factor
(c) Failure of conservatism

Prep (1) Removal of septic foci
(2) Rest in bed for 3 weeks
(3) Low diet
(4) Hydrotherapy 3000—4000 c cs per day
Oral, rectal, subcutaneous
(5) Lugol s iodine for 3 weeks
(6) Treat the heart digitalis
(7) Treat the diabetes
(8) Sedatives and mental assurance
Bromides chloral hydras, luminal

Anæsth (A) Local novocain + open ether
(B) Rectal olive oil + ether
(C) Intra tracheal ether, $N_2O + O_2$ or cyclopropane

Operations (A) Ligature of sup or inf. thyroid art.
Ind (a) Preliminary in severe cases
(b) Mild cases
(May be done under local even in patient s bed)
(B) Subtotal thyroidectomy
Def Removal of all *but a thin posterior slice of each lobe*
Steps (1) Wide collar incision
(2) Skin platysma flap retraction
(3) Sternomastoid retraction
(4) Division of ant. jugular veins
(5) Division or separation of pre tracheals
Transverse cut at upper with middle thirds
(6) Treatment of the lobes
(a) Ligation and division of
(α) Superior thyroid vessels
(β) Middle and inf thyroid veins
(γ) Inf. thyroid artery
(b) Excision of the lobe
Leaving behind a button of thyroid tissue
(7) Treatment of isthmus
(8) Re-suture of pre-tracheal muscles
(9) Drainage
(a) 24 hours
(β) Till temperature is normal

After treat (a) Morphia
(b) Rectal 4 hourly
Saline + glucose + Lugol 30 min
Bromides
(c) Rest in bed for 3 weeks
Then gradually up to normal envir ents
Post. compl (1) Post operative crisis
Treat (a) Oxygen inhalations
(b) Ice packs temp above 104
(c) Lugol s iodine
(α) By mouth 10 min T D S
(β) By rectum 30 min
(γ) Intravenous 20-40 min
Diluted in saline
(d) Saline + glucose + Lugol
Continuous intravenous
(e) Insertion of a drain
(f) Morphia
(2) Mechanical dyspnoea
Causes (a) Hæmorrhage
(b) Recurrent laryngeal trauma
(c) Tracheal collapse
Treat (1) *Prophylactic suture of trachea to muscles*
During the thyroidectomy
(2) Sitting posture + flexion head
(3) Oxygen tent
(4) Intubation larynx
(5) Tracheotomy
(3) Parathyroid tetany (See under Parathyroids)
Treat (a) Intravenous
Calcium gluconate 10% 10 c cs
(b) Oral
Calcium lactate 2 teaspoonfuls every hour
(c) Parathormone intravenous
(4) Heart failure
Treat Morphia and digitalis
(5) Reactionary haemorrhage
Clinic (a) Soiled dressings
(b) Asphyxia
Treat (a) Re-open the wound
(b) Turn out the clot
(c) Ligate the bleeding point
(6) Recurrent laryngeal trauma
Etio (a) Pressure from œdema or hæmorrhage
(b) Crushing by forceps
(c) Inclusion in ligature
Treat, Prophylactic
(a) *Leave in posterior slice of thyroid*
(b) *Ligate the inferior thyroid within the thyroid tis.*
(c) *Preliminary visualisation of the nerve*

(7) Shock
(8) Collapse of the lung
Sequelæ (1) Altered voice Recurrent nerve trauma
(2) Recurrence of toxicosis Too little excision
(3) Myxoedema
Etio Too much excision
Treat Thyroid medication or implantation
Post-oper stages
(1) Stage of reaction
Time Immediate post-operative period
Clinic Thyroid crisis
Duration 2 to 3 days
(2) Stage of primary improvement
Time After first stage
Clinic Subsidence of crisis → apparent cure
Duration 2 to 3 weeks
(3) Stage of primary relapse
Time After return home
Cause Want of rest and excitement
Clinic Mild toxicosis
Duration 2 to 3 months
(4) Stage of instability
Time After 2 to 3 months
Clinic (a) Cured when protected
(b) Toxic syndrome when excited
Duration 2 to 3 years
(5) Stage of complete cure
Results Best in late secondary thyrotoxicosis
(a) *Heart troubles 80% benefited*
(b) Glycosuria improved
(c) Mental disturbances better
(d) Exophthalmos slow in improvement
(4) THYROID CARCINOMA
Contraind (a) Presence of dilated veins
(b) Wide involvement of muscles
(c) Presence of secondary deposits
(d) Evidence of advanced local pressure or ulceration
(1) Severe cough
(2) Blood-stained sputum
(3) Recurrent laryngeal nerve palsy
(4) Big blood vessels
(5) Œsophagus
Preoper X Ray exposures
Operations (1) Local growth
Partial or hemi thyroidectomy
(2) Local growth in diffuse goitre
Complete thyroidectomy
(3) *Diffuse growth*

(a) Ligation and excision of internal jugular vein
On the side of greater involvement
(b) Complete thyroidectomy
+ (c) Crile s block dissection
Post oper X Ray exposures

IMPORTANT POINTS

(1) *Thyroid tumours move on deglutition*

(2) Signs of goitre
- (a) Anatomical (α) Deformity
  - (β) Pressure signs
- (b) Physiological (α) Hyper thyroidism
  - (β) Hypo thyroidism

(3) Differential diagnosis in thyrotoxicosis
- (a) Primary thyrotoxicosis
  - (α) Goitre not prominent
  - (β) Exophthalmos and nervous syndrome prominent
  - (γ) (α) and (β) are simultaneous
- (b) Secondary thyrotoxicosis
  - (α) Goitre prominent
  - (β) Exophthalmos & nervous syndrome non prominent
  - (γ) Cardio vascular signs prominent
  - (δ) (α) precedes (γ) by many years

(4) *Keep a watch for toxic signs in cases of non toxic goitre receiving Lugol s iodine*

(5) *Lugol s iodine* should not be used over a prolonged period and is not a substitute for operation its chief value is *in the pre operative and post operative periods*

(6) *Nodular involutional goitres and innocent thyroid tumours are pre cancerous*

(7) *Biopsy is of extreme importance in thyroid surgery*

(8) *A local focus in a bone in old age examine thyroid*

(9) *Colloid adenoma is not a new growth* it is a degeneration cyst

(10) *In retro sternal goitre beware of sudden severe respiratory crisis during the night*

(11) Physiological thyroid enlargement occurs when the gland is unable to meet without effort the increased demands of a physiological emergency such as puberty, pregnancy, climacteric etc Enlargement persists when it is unable to meet the demands of the maturing or matured body

(12) Physiological sequence in thyroid
- (a) Normal thyroid
- +(b) Increased physiological demands

↓ (c) Hypertrophy + hyperplasia physiological goitre
↓ (d) Involution
↓ (e) Hyper involution involutional goitre

(13) Owing to the constantly varying demands of the body throughout life the cycle of normoplasia → hyperplasia → involution → hyper involution continues

(14) External laryngeal nerve (to cricothyroid) is in very real danger during the ligature of superior thyroid artery, causing temporary weakness of voice (*ligate the sup thyroid vessels as near the upper pole as possible*)

(15) Damage to one external laryngeal nerve causes temporary husky voice, damage to one recurrent laryngeal nerve causes permanent huskiness.

(16) Apart from neoplasm, non toxic goitre in all its stages originates in hyperplasia, either diffuse or localised, and *all the succeeding changes result from involution—normal, excessive or incomplete*—and fibrosis

(17) Earlier the toxic change supervenes on a colloid goitre, more nearly do the signs and symptoms approach those of primary toxic or exophthalmic goitre

(18) *The manifestations of toxic goitre differ according to variations in three factors*
   (a) *Intensity of stimulation*
   (b) *State of thyroid epithelium*
       Normal or involuted
   (c) *Age and quality of heart*

(19) *Primary toxic goitre is most common in early adult life Early secondary type begins to be met with in the third decade and late secondary type comes on about the time of climacteric*

(20) As *the period between the first appearance of goitre and the onset of toxic symptoms lengthens less frequent and less pronounced are the eye signs, they are absent in late toxic goitre*

(21) In children, thyrotoxicosis is characterized by abrupt and *rapidly developing clinical* course
   (a) Nervousness
   (b) Goitre
   (c) Tachycardia
   (d) Exophthalmos.

(22) In primary toxic goitre toxic features have developed in a thyroid gland which is healthy, in secondary toxic goitre, toxic features have developed in a gland which is already a seat of colloid goitre

(23) *Operation gives best results in late secondary thyrotoxicosis with cardio vascular syndrome*

(24) Colloid adenoma is a cystic degeneration of local involutional nodule, fœtal adenoma is a new growth

(25) Reduction in the amount of colloid and epithelial proliferation are characteristic features of toxic goitre

(26) *Iodine produces very marked temporary amelioration of symptoms due to involutionary changes in toxic goitre*

(27) Manifestations of secondary toxic goitre are less pronounced than those of primary toxic goitre, as the first supervenes on an already exhausted glandular epithelium, while the second supervenes on a physiologically active gland

(28) *The effect of toxic goitre in young patients is on the central nervous system, while in later life, it acts chiefly on cardio vascular system*

(29) Primary Graves' disease is a condition affecting young women in whom the goitre and toxic syndrome—ocular, cutaneous, circulatory, nervous and gastro intestinal—appear simultaneously and is characterised by periods of exacerbation occupying 6 to 9 months

(30) Exophthalmic goitre is due to dys-thyroidism rather than to hyper thyroidism

(31) Secondary Graves' disease is rarely seen except in women over 40, in whom a simple goitre or a group of adenomata has been present for at least 15 years The course is steadily progressive and symptoms mainly affect cardio vascular system

(32) *In secondary thyrotoxicosis, preliminary iodine treatment is valueless, in primary thyrotoxicosis, iodine treatment should be given a full trial for at least six months before operation is undertaken*

(33) *Lugol's iodine solution*

Chemistry *5% of iodine in 10% aqueous sol of pot iodide*

Dose (a) *10 min daily in a glass of water for 21 days*

(b) *30 min per rectum in saline*

(c) *20–40 min intravenous in saline*

(34) *Thyro adenoma malignum gives rise to functioning metastases in bones* where they form large, soft, pulsating tumours, *the primary thyroid growth being insignificant,*

(35) Metastases from a malignant thyroid may be physiologically active

(36) *Malignancy practically never occurs in cases of primary toxic goitre but toxic symptoms may develop in association with malignant disease*

(37) *85% of thyroid cancers originate in adenomata*

(38) Gross erosion of vessel walls and finding of tumour cells within the lumen of veins, are the most valuable criteria of malignancy

(39) Basal metabolic rate is the best guide to the amount of thyroid substance which must be taken away

(40) Thyroid secretes thyroxine which acts as a catalyst regulating the rate of metabolism

(41) *Every thyroid removed must undergo biopsy*

(42) *Supervention of toxicosis in a simple goitre should lead to suspicion of malignancy*

(43) *Thyroid carcinoma*

(A) *Papilliferous*

(*a*) Slow and of low malignancy

(*b*) Lymphatic metastases

(B) *Malignant adenoma*

Types (*a*) *Metastasising* slow

(*b*) *Proliferating* rapid and highly malignant

Metastases (*a*) Blood stream

(α) Bones functioning secondaries

(β) Lungs

(*b*) Lymphatic

Regional lymph nodes

(C) *Scirrhous*

Local and lymphatic infiltration

(44) Sudden increase in size onset of toxicity, altered contour, fixation pressure altered voice enlarged lymph nodes hæmoptysis or any local bone lesion in an elderly patient who has had a goitre should arouse a suspicion of malignancy

(45) Remove a single circumscribed enlargement in the thyroid in a person in the cancer period of life, as soon as it begins to cause discomfort

(46) In malignancy of the thyroid, extirpation should always be followed by deep X Ray therapy

(47) *Dysphagia with thyroid enlargement should arouse a* suspicion of malignancy

(48) *In hypo thyroidism, all activities of body are depressed*

(49) Prostate is enucleated *from* its true capsule, thyroid is removed *with* its true capsule from its false capsule.

(50) *Any kind of a febrile tachycardia must be looked upon as possibly of thyroid origin*

(51) *Outstanding thyrotoxic syndrome*

(1) *Cardio vascular*

(2) *Nervous*

(3) *Ocular*

(4) *Muscular*

(5) *Metabolic*

(6) *Gastro intestinal*

(52) Sequence of cardiac disturbances in thyrotoxicosis:
(a) Simple tachycardia
(b) Dilatation
(c) Functional mitral regurgitation
(d) Cardiac irregularity

(53) *In hypo thyroidism, various milestones in the course of the child s development are reached much later than normal*

(54) One of the most interesting developments in surgery of the thyroid is the *improvement in cases of angina pectoris and congestive heart failure after removal of the gland* which lessens the amount of work to be done by the heart by lowering the metabolic rate

(55) *Three chief complications of total thyroidectomy are.*
(a) Injury to recurrent laryngeal nerve
(b) Parathyroid deprivation
(c) Myxœdema

(56) *To obtain good results in major surgery, the most meticulous personal care should be given to the patient before and after the operation, a good operator is not necessarily a good surgeon—in fact, a good operator may be a menace to the science of surgery*

(57) Every vestige of the thyroid gland should be removed in heart indications, anginal type of cardiac failure is benefited more than congestive heart failure (rheumatic or hyper tensive) by the total thyroidectomy

(58) *Heart patients who do not respond to rest or medical treatment, do not derive any benefit from the total thyroidectomy, which should not be done in hopeless cases*

(59) *Position of recurrent laryngeal nerve*
(a) Penetrating the gland
(b) Adherent to the gland
(c) Tracheo œsophageal sulcus.

(60) Cartilaginous prominence of inferior cricothyroid articulation is a valuable surgical landmark for recurrent laryngeal nerve as it enters the larynx, it may pass anterior or post to or lie between the branches of inf thyroid artery

(61) *Bone metastases may be the first indication of thyroid cancer as in prostatic cancer*

(62) Persistent growth of an adenoma with fixation to the surroundings should arouse suspicion of thyroid malignancy

(63) Presence of distant metastases should not necessarily be a contraindication for removal of an encapsuled and obstructing malignant adenoma.

(64) Clinical diagnosis of thyroid malignancy can only be made after the growth invades the surrounding tissues

(65) Operability of thyroid malignancy depends on the extent of the local lesion and the absence of distant metastases.

(66) During removal of a carcinomatous thyroid, it is usually unnecessary *to remove* adjacent lymph glands unless they are obviously involved

(67) *Thyro glossal fistulæ are in the midline of the neck, near about the hyoid* and may be multiple they are easily mistaken for tuberculous sinuses, X Ray after lipoidol is a good pre operative step

(68) *It is finesse, not force, that brings success in goitre—in fact in any surgery*

(69) Pneumonia is the most common cause of death in elderly goitrous patients after thyroidectomy

(70) In thyrotoxic thyroidectomy, it is better to remove too much than too little.

(71) Factors determining the extent of thyroid to be resected
(a) Severity of thyrotoxicosis
(b) Size of the gland
(c) Involution following iodine medication
Pale œdematous gland

(72) Initial attack on upper pole and minimal use of silk ligatures are modern variations in thyroidectomy

(73) Exophthalmos is best treated by early thyroidectomy, as it is more likely to persist in long standing cases

(74) Injury to one recurrent laryngeal nerve is an unfortunate accident, resulting in hoarse voice, while injury to both recurrent laryngeal nerves is a serious surgical calamity giving rise to dyspnœa. Preliminary dissection and visualisation of the nerve should be practised before cutting or clamping any tissue nearby, especially the inferior thyroid arterial branches

(75) *Factors in lowering mortality of thyroidectomy for thyrotoxicosis are*
(a) Early operation
(b) Multiple stages operation
(c) Local and mental analgesia
(d) Gentle, precise bloodless technique

(76) Toxic thyroid disease is a very deadly condition in Negroes.

(77) Kocher used collar incision in 1898, which was described by Bœkel some thirteen years before

(78) It was Sir Thomas Dunhill who instituted the modern bilateral operation for thyrotoxicosis

(79) Tetany is very rarely seen today because of the almost universal practice of *preserving a small slice of thyroid tissue in relation to the hilum of the gland i e that part at which terminal branches of the inf thyroid art enter the gland*, both the recurrent nerve and the parathyroid are spared

(80) Presence of toxic symptoms with a localised adenoma is suggestive of the onset of carcinomatous change

(81) *No operation on colloid goitre should be undertaken unless some complication is present*

(82) *Many of the colloid goitres turn toxic by prolonged use of Lugol s iodine*

(83) *Clinical types of toxic goitre*
- (a) *Vascular type*
- (b) *Nervous type*
- (c) *Goitrous type*
- (d) *Metabolic type*

(84) *Clinical forms of carcinoma thyroid*
- (a) *Latent type secondary to simple goitre*
- (b) *Localised pseudo adenoma type*
- (c) *Secondary deposit type*

(85) Use of X Rays is most helpful and almost specific in thyroid carcinoma and so should be used in every case as a post operative measure or a palliative step

(86) No cyst or tumour in the line of thyro glossal duct should ever be operated upon until it is certain that there is a normal portion of thyroid in the normal place

(87) If a patient with a goitre is suffocating, assume always that the goitre is the cause, urgent dyspnœa may follow a sudden hæmorrhage into a cystadenoma of thyroid, especially if retro sternal

(88) *Treatment of retro sternal goitrous asphyxia is immediate aspiration of the cyst or decompression and extrusion of the lobe Tracheotomy is useless*

(89) Causes of dyspnœa in goitre
- (a) Pressure on trachea
  - (α) Retro sternal goitre
  - (β) Hæmorrhage
    - (1) Intra cystic
    - (2) Post thyroidectomy
- (b) Bilateral recurrent laryngeal trauma
- (c) Tracheal collapse

(90) Real justification of iodine therapy in thyrotoxicosis is its value as a pre operative treatment in primary cases, it gives bad results in secondary cases

(91) Pre operative careful preparation of patients requiring thyroidectomy for thyrotoxicosis, is the key note to uniform success (a) eradication of septic foci + (b) iodine + (c) rest, until the patient is gaining weight and overcoming mental instability and muscular weakness must always be enforced before every thyroidectomy

(92) Preliminary ligature of sup and inferior thyroid vessels under local anæsthesia sometimes improves the cases,

where iodine therapy and rest have failed and where thyroidectomy is too severe a procedure as judged from the state of the patient

(93) *Patients with active hyperthyroidism find difficulty in mounting on to a high box or stool in the erect posture, owing to weakness of quadriceps extensor*

(94) Essential points in thyroid surgery are gentle manipulations and scrupulous hæmostasis If more than 20 oz. of blood is lost, it is a danger signal Actual loss of blood can be ascertained by weighing the swabs before and during the operation

(95) *Extra care should be used in ligating vessels in the neck, the patient should be asked to cough and strain before final closure of the wound*

(96) If glycosuria is not controlled by insulin in thyrotoxicosis, thyroidectomy becomes imperative

(97) Thyrotoxicosis may lead from slight loss of mental balance to complete mental derangement

(98) Cellulitis in the midline in the lower half of the neck is most often secondary to acute thyroiditis

(99) *Nervous symptoms abate, weight is regained, muscular weakness disappears, but exophthalmos lags behind after thyroidectomy for thyrotoxicosis*

(100) Superior laryngeal nerve supplying inter arytenoids, is as important as recurrent laryngeal

(101) *Intra thoracic goitre should always be borne in mind in obscure cases of asthma or dyspnœa or mediastinal tumour*

(102) *For practical purposes all intra thoracic goitres are adenomatous in origin, thyrotoxicosis is rare in these cases*

(103) *Presence of a mediastinal lesion should always be suspected in the presence of dilated superficial thoracic veins*

(104) Para goitrous lesions in goitrous areas
- (*a*) Arrest of growth
- (*b*) Mental deficiency → idiocy
- (*c*) Stammering
- (*d*) Deaf mutism.

(105) Exophthalmos is not due to thyroxine but is caused by thyrotropic hormone of the anterior pituitary and is usually the last sign to clear up after operation

(106) *Digitalis is ineffective in thyrotoxic tachycardia unless there is cardiac failure*

(107) *Dyspnœa is the commonest symptom of malignant thyroid*

(108) Ordinary diffuse colloid goitre is not associated with any tendency to malignant change.

(109) Carcinoma thyroid resembles carcinoma prostate, in which prognosis is bad except in cases accidentally discovered on histological examination of the excised specimen

(110) It is best to assume that all malignant tumours of the thyroid are malignant adenomas and to resect the veins along with the tumour

(111) *All patients, at whatever age, with unexplained arrhythmias, should be suspected of thyrotoxicosis*

(112) Masked hyper thyroidism
- (a) Cardio vascular irregularity
- (b) Emotional temperament
- (c) Staring look
- (d) Fine tremors
- (e) Loss of weight
- (f) Tendency to require fewer bed clothes
- (g) Glycosuria
- (h) Gastro intestinal syndrome

(113) For thyrotoxicosis inferior thyroid artery should be ligated rather than the superior, as it is the main artery to the parenchyma, but the latter is more accessible

(114) Most important single feature relating to mortality of the surgery for thyrotoxicosis, is the pre-operative decision as to how severe the thyroid intoxication is *The patient must be seen when at his worst, before operation*

(115) High carbohydrate diet is essential in the pre operative period of thyrotoxicosis, as hepatic insufficiency is a factor in fatal cases.

(116) *Be sure of complete hæmostasis and absence of all respiratory difficulty at the conclusion of thyroid operation*

(117) *Laterally placed aberrant thyroids are very liable to undergo malignant degeneration and are easily mistaken for lymph nodes*

(118) Immediate cause of all simple goitres is failure of access of sufficiency of iodine to the thyroid, in endemic goitre, it is due to environmental deficiency of iodine, in sporadic goitre, it is due either to interference with absorption of iodine or to relative iodine deficiency caused by increased demand by the body, than is available in the thyroid

(119) *Thyrotropic hormone of the ant pituitary is the potential causative agent of Graves' disease*

(120) *The use of the pulse rate and the blood pressure as an index of basal metabolic rate, is theoretically sound and practically useful*

(121) Carcinoma thyroid is usually of low grade malignancy and yet relatively radio sensitive.

CHAPTER III

THE PARATHYROIDS

(I) ANATOMY Four, brown, small, flattened bodies with stalks

Lobes (A) Superior one on each side
- Site Near the upper pole
- Blood Superior thyroid artery
- *Nerve Superior laryngeal*

(B) Inferior one on each side
- Site Hilum of the thyroid Inferior thyroid artery
- Blood Inferior thyroid artery
- Nerve Recurrent laryngeal

Site (*a*) Between the fascia covering the trachea and thyroid
- (*b*) Posterior to tracheal fascia
- (*c*) In the thyroid tissue

(II) PHYSIOLOGY

Histology Columns of cells with numerous wide vascular channels
- (*a*) Non granular cells
- (*b*) Few eosinophils

Secretion. Parathormone

Function (1) Regulation of serum calcium
- Normal 10 mgm per 100 c.cs
- (2) Maintenance of correct balance between blood ions

Extirpation (1) Tetany
- Increased excitability of motor nerves and certain parts of *central nervous system*
- + (2) Fall in serum calcium
- 8-6 mgm.

Over-secret. (1) Resorption of calcium from bones
- + (2) High serum calcium
- + (3) Calcinuria

(III) HYPO PARATHYROIDISM:

(1) TETANY.

Syn: Spasmophilia

Def. Heightened excitability of motor nerves and certain parts of central nervous system due to lowering of serum calcium.

Causes: (1) [illegible] serum calcium
(2) [illegible]

Etio: (1) [illegible]
([illegible]
([illegible]
(α) Intentional.
; Excision of parathyroid adenoma

(β) Accidental: (See under Thyroid)
. In thyroidectomy

(2) **Alkalæmia:**
(a) Gastric tetany
Incessant vomiting
(b) Hyperpnœa
(c) Excessive ingestion of alkalies

(3) **Nephritis**

(4) **Rickets** and osteomalacia

Clinic (1) **Carpopedal spasm:** Trousseau
Obstetric position of hands

(2) **Facial irritability:** Chvostek
Tap on facial nerve → facial spasms

(3) **Laryngismus stridulus:**
Crowing respiration

(4) **Galvanism:**
Increased excitability of motor nerves to galvanic currents

(5) **Low serum calcium:**
8–6 mgm per 100 c.cs

Treat (1) **Intravenous parathormone:**
10–30 units a day

(2) **Intravenous calcium:**
(a) Ca chloride
(b) Ca gluconate 10 c.cs of 10%
(c) Ca lactate 40–60 gms
5% solution every 2 hours

(3) **Irradiated ergosterol**

(4) **Parathyroid grafts**

(2) CALCIUM DISTURBANCES

(1) **Opacity of the lens**
(2) Brittleness and ridging of nails
(3) Loss of hair and dental enamel
(4) **Low serum calcium:**
8–6 mgm per 10 c.cs

(IV) HYPER PARATHYROIDISM.

Etio (1) Hyperplasia bilateral
(2) **Adenoma:** Unilateral

Types (A) **Primary:**
Path (a) Hyper parathyroidism
↓ (b) Renal disease
Diag (a) Unilateral hyperplasia
(b) High serum calcium

(B) **Secondary:**
Path (a) Renal disease
↓ (b) Hyper parathyroidism
↓ (c) Bone dystrophies

Diag: (a) Bilateral hyperplasia
(b) [illegible]

Clinic. syn. (1) [illegible]

[illegible]

(2) [illegible]

(3) [illegible]

with impaired renal functions

(4) **Abnormal calcifications**

(5) **Gastro-intestinal disturbances**

(6) **High serum calcium:**
: 18–20 mgm per 100 c.cs

(V) TUMOURS:

Path (1) **Adenoma:**
Morb anat Interlacing compact cords or masses of large clear cells, separated by vascular spaces

(2) **Carcinoma:**
Morb anat (As above)
+ (a) Infiltration
(b) Metastasis.
(α) Lymphatic
(β) Blood stream

Clinic: (1) Hyper parathyroidism syndrome
(2) Parathyroid tumor:
: Palpable or impalpable

(VI) PARATHYROIDECTOMY:

Tech. (1) Wide thyroid exposure
(a) Adequate thyroid incision
(b) Transverse cut of infrahyoid muscles
(2) Ligature of middle thyroid vein
(3) Rotation inwards of thyroid border
(4) Isolation & retraction of great vessels
(5) Demonstration of inferior thyroid artery
(6) Search for the adenoma
(a) Behind the thyroid lobe
(b) Behind the artery and recurrent nerve
(c) Oesophago-tracheal groove
(d) Behind the superior pole
(e) Within the thyroid tissue
: Palpate the gland thoroughly
(f) Within the thoracic inlet
(7) Excise

IMPORTANT POINTS

(1) Parathyroids govern the calcium metabolism and abnormalities in bones in generalised osteitis fibrosa are due to parathyroid secretion causing an excessive stimulation of osteoclastic resorption of bone.

(2) *Parathyroids are necessary for a proper deposition of calcium in osteoid tissue during periods of growth and repair.*

(3) Principal factor in the production of parathyroid tetany is lowering of serum calcium which produces hyper excitability of the peripheral nerves and central nervous system

(4) *Parathyroids play a very important part in the regulation of the calcium concentration of blood serum and maintenance of a proper balance between certain ions in the body Tetany is hyper excitability of motor nerves and of central nervous system due to lowering of diffusible ionised calcium In hyper parathyroidism, there is excessive mobilisation of calcium from the bones, excessive retention in blood serum and excessive excretion in urine, giving rise to decalcification of bones and tendency to urinary stones*

(5) *Upon the correct metabolism of calcium depends*
   (a) *Growth and stability of skeleton*
   (b) *Irritability of muscles and nerves*
   (c) *Coagulation of shed blood*

(6) The normal amount of calcium in blood is between 9 and 11 mgms per 100 c cs of blood In tetany, there is hypo calcæmia upto 6 mgms In parathyroid hyperplasia, there is hyper calcæmia upto 20 mgms

(7) There is a danger of removal of both sets of parathyroid in operation for complete thyroidectomy and of interference with their blood supply if inferior thyroid artery is ligatured at a distance from the gland, leave back the posterior slice of thyroid tissue to ensure safety of the parathyroids and recurrent laryngeal nerves Where thyroidectomy must be complete, have recourse to preliminary dissection, visualisation and protection of both these structures

(8) A solution of calcium lactate, sufficient to provide 1 5 to 2 5 gms of calcium per day is the best way of giving calcium over long periods.

(9) *Ether convulsions are due to hyperpnœic tetany and are rapidly checked by injection of 10 c cs of 10% calcium gluconate*

(10) Parathyroids are synergic with pancreas and under the influence of vagus, the pituitary, the thyroid and the adrenals form a synergic group under the sympathetic.

(11) Dysfunction of parathyroid bodies is now definitely associated with a rather high incidence of renal lithiasis

(12) Renal lithiasis may occur without any bone changes in hyper parathyroidism.

(13) Parathyroids may be found at practically any position, behind, below or even *in* the thyroid

(14) Parathyroid adenomas are usually freely movable on thyroid tissue

(15) We all, particularly the orthopædist and the urologist, must be on the look out for hyper parathyroidism in patients with
- (a) Pain in the back or extremities
- (b) Diffuse neuritis
- (c) Arthritic pains worse on motion
- (d) Progressive loss in stature
- (e) Urinary stones

(16) *Many patients with hyper parathyroidism, who could be relieved of their condition by surgical removal of a para thyroid adenoma, have in the past and are still passing through our hands with their condition undetected and hence untreated*

(17) *Renal calculi may be the first sign of generalised osteitis fibrosa or of hyper parathyroidism*

(18) Deficiency of vitamin D may be an important factor in hyperplasia of the parathyroid

(19) Parathyroid enlargements occur not infrequently in nephritis, if sufficiently chronic in type

(20) Tetany and cataract are dangers of too extensive deprivation of parathyroids.

CHAPTER IV

THE ADRENALS

(I) ANATOMY

Gross Triangular, paired structure
Situated at the upper pole of the kidney

(A) Cortex Developed from mesoblast

Histology Columns of polyhedral cells with well marked nuclei

(a) Zona glomerulosa parallel to surface
(b) Zona fasciculata vertical to surface
(c) Zona reticularis irregular

Hyperplasia (1) Precocious sexual maturity
Male and female children
(2) Reversion to opposite sex
Adult females

Hypoplasia Addison's disease
(a) Asthenia
(b) Cachexia
(c) Hypo piesia
(d) Apathy
(e) Hypo-genitalism
(f) Pigmentation and bronzing

(B) Medulla Chromaphil autonomic tissue

Histology Irregularly arranged cells
(a) Chromaphil tissue
(b) Large blood spaces

Function Adrenaline *Sympathetico mimetic*

Effects (a) Eye (α) Dilatation of pupil
(β) Retraction upper lid
(γ) Exophthalmos
(b) Heart acceleration and accentuation
(c) Bronchi relaxation
(d) Intestines (α) Inhibition of peristalsis
(β) Closure of sphincters
(e) Liver conversion of glycogen into glucose
(f) Spleen contraction
↓ Release of R B Cs. in circulation
(g) Bladder (α) Relaxation of detrusor
(β) Constriction of sphincter
(h) Uterus inhibition
(i) Skin (α) Excitation erectors pili
(β) Constriction of arterioles
(j) Splanchnic arteriolar constriction
(k) Muscles diminution of fatigue
(l) Blood pressure rise
(m) Basal metabolism; rise

Functions: Of adrenaline: *preparation for emergency*
(1) *Re-distribution of blood*
(2) *Stimulation of heart*
(3) *Rise in blood pressure*
(4) *Increase of R. B Cs in circulation*
(5) *Relaxation of bronchi*
(6) *Mobilisation of glycogen*
(7) *Diminution of fatigue*
(8) *Inhibition of plain musculature*

(II) PATHOLOGY:

(A) CORTEX:

(1) *Vascular lesions:*
(*a*) Hæmorrhage: sudden death
Etio: (α) Acute infectious diseases
(β) Post operative
(*b*) Thrombosis
(*c*) Infarction

(2) *Hyperplasia:*
Causes: (*a*) **Simple cortical nodules:**
(α) Fœtal
(β) Sclerotic
(γ) Accessory adrenals
(δ) Cortical rests:
(1) Under surface of liver
(2) Epididymis
(3) Uterine adnexa
(4) Retro peritoneal tissue
(5) Upper pole of the kidney

(*b*) **Simple hyperplasia:**
(α) Physiological: pregnancy
(β) Acute infections
(γ) Middle life: after 40
(ξ) Essential hyperplasia of virilism

(*c*) **Neoplastic:**
(α) **Adenoma:**
Path. Multiple, bilateral
Morb. anat: *Well defined nodules of bright yellow* colour, with an arrangement like zona fasciculata.

(β) **Carcinoma:**
Etio: Age: (1) *Any*
(2) Infancy to puberty
(3) Fifth decade
Path. types: (*a*) Adeno-carcinoma
(*b*) Carcinoma proper
(*c*) Diffuse carcinoma

Morb anat (1) Secondary degeneration
Soft yellow, cystic
(2) Growth along veins
Pulmonary and bone metastases

Clinic Of hyperplastic lesions
(1) **Precocious puberty**
(A) Male (*a*) Obese form
(*b*) Hercules form
(B) Female obese form
(2) **Reversion to male sex** In adult females
(*a*) Hirsutism of face
(*b*) Coarse voice
(*c*) Male configuration
(*d*) Amenorrhœa

(B) MEDULLA

(1) **Paraganglioma**
Syn (*a*) Chromaffin tumour
(*b*) Pheochromocytoma
Site (1) Sympathetic plexuses
(2) Carotid body
(3) *Adrenal medulla*
(4) Fœtal organ of Zuckerkandl
Path (*a*) Pleomorphic small cells
(*b*) Vascular
(*c*) *Benign*
Etio After 40
Clinic (*a*) Paroxysmal palpitations
(*b*) Hyperpiesia
(*c*) Tremors
(*d*) Cold extremities

(2) **Ganglioneuroma**
Etio Adults
Path (*a*) Ganglion cells
(*b*) Nerves medullated and non medullated
(*c*) Glial tissue
Site Any tissue of the body *sympathetic ganglia*
Clinic Multiple white *benign* tumours

(3) **Neuroblastoma**
Syn Sympathetico blastoma
Etio Infancy or childhood
Path (*a*) Deeply staining cells in rosette
(*b*) *Highly malignant*
(*c*) Metastases
Clinic (1) *Retro peritoneal infiltrating mass*
(2) Extensive metastases

(A) Hutchinson's syndrome
Primary Left adrenal
Metastases. Bones ribs, orbits, skull
Via Thoracic duct

(B) Pepper syndrome
Primary Right adrenal
Metastases Liver and lungs
Via Lymph channel

(4) **Melanoma:**
Etio Adults
Origin Neurogenous

(5) **Metastatic growths**
Primary in bronchi

(III) ADRENAL OPERATIONS

(1) Adrenal denervation
Ind (*a*) Neuro-circulatory asthenia
(*b*) Essential hyper tension
(*c*) Hyper thyroidism
(*d*) Diabetes secondary to hyper thyroidism
Tech (1) Position kidney
(2) Incision kidney → ureter
(3) Exposure and isolation of kidney
(4) Exposure of adrenal
(5) Cutting of nerve filaments

(2) Adrenalectomy
Ind Adreno-genital syndrome
Treat (*a*) Trans thoracic route (Broster)
(*b*) Sub-diaphragmatic lumbar route (Walters)
Mobilisation of last rib
(*c*) Trans peritoneal route (Cahill)
Results (*a*) Good in post puberal virilism
(*b*) Disappointing in pre puberal virilism

(IV) ADRENO GENITAL SYNDROME

Def Appearance of secondary male characters in the female, associated with retrogression of primary and secondary feminine characters

Etio (*a*) Hereditary
(*b*) Familial

Factors (1) **Adrenal hyper function.**
(*a*) Hyperplasia
↓ (*b*) Adenomata
↓ (*c*) Adeno carcinomata

(2) **Age:**
(*a*) Sexual immaturity
(*b*) Sexual maturity

Clinic: (1) **Hyper-trichosis:**
- (a) Chin
- (b) Lips
- (c) Chest and abdomen

(2) **Male contour of the body:**
- (a) Overgrowth of skeleton
- (b) Shoulders broader than pelvis
- (c) Enlarged clitoris
- (d) Deepening of voice

(3) **Immature development of female genitalia:**
- (a) Enlargement of male elements
- (b) Diminution of female elements

(4) **Psychological change to male type**

(5) **Migrainous headache**

Classific: (1) Adrenal pseudo hermaphroditism:
Cause: *Changes before sexual maturity*

(2) Adrenal virilism:
Cause: Changes after puberty

(3) Achard Thier's syndrome:
Cause: Multi glandular hyperplasia.
- (a) Adrenal
- (b) Ovaries
- (c) Pituitary
- (d) Thyroid

Clinic: (a) Facial hyper-trichosis
- (b) Obesity
- (c) Glycosuria
- (d) Hyper tension
- (e) Amenorrhœa

Treat: Unilateral adrenalectomy.

IMPORTANT POINTS

(1) *General effect of adrenaline is to redistribute the blood in the body and adapt the circulation better to cope with conditions of stress*

(2) *Fuchsinophil granules in adrenal cortex is the main factor in virilism*

(3) Cortex of adrenal develops from genital mesothelium.

(4) Medulla of adrenal develops from sympathetic ganglionic crest.

(5) Development of adrenal becomes complete in second year of post natal life

(6) Anencephaly and adrenal dystrophy co exist and the former may be the result of the latter.

(7) Adrenal medulla is closely concerned, in association with thyroid, in the regulation of body temperature.

(8) Cortical adrenal rests are common, most common in the liver and rarely form the sites for any tumour

(9) Adrenal hyperplasia in pregnancy is associated with hyper cholesteræmia and increased lipoid metabolism

(10) Essential hyperplasia of the adrenal cortex which is accompanied by virilism is the only form of simple enlargement which is associated with a definite clinical syndrome or which calls for surgical interference

(11) *Cortical carcinomata from the bulk of adrenal neoplasms*

(12) *Metastases*
- (a) *Pulmonary metastases in adrenal malignancy*
- (b) *Skeletal metastases in kidney malignancy*

(13) *Adrenal cortex exerts a profound influence upon the development and functions of the sex glands, causing*
- (a) *Hermaphroditism*
- (b) *Hetero sexual prematurity*
  Adreno genital syndrome
- (c) *Homo sexual prematurity*
  Pubertas præcox
- (d) *Virilism*

(14) Clinical syndrome
- (A) Simple hyperplasia
  Puberal virilism
- (B) Adrenal adeno carcinoma
  - (a) Childhood sexual changes
    - (α) Hetero sexual
    - (β) Homo sexual
  - (b) Virilism in elderly women

(15) Adrenal clinical syndrome
- (A) Simple hyperplastic hyperfunction
  - (a) Fœtal hermaphroditism
  - (b) Puberal virilism
- (B) Adeno carcinoma
  Masculinisation at any age
- (C) Pure carcinoma
  No effect on sexual growth

(16) *Fuchsinophil material of the adrenal cortex seems to be functioning as a masculinising hormone*

(17) Hermaphroditism of adrenal origin is the immediate and virilism *is* the delayed or latent result of a failure of inhibition of the normal male phase of the female fœtus due to presence of fuchsinophil material in adrenal cortex

(18) Anterior pituitary may have some control on adrenal cortex as Cushing's syndrome would show

(19) Tumours of the adrenal medulla

(A) Innocent and in adults:
(a) Paraganglioma or chromaffin tumour
(b) Ganglioneuroma
(B) Malignant and in children:
: Neuroblastoma

(20) *Orbital tumour of the left side with ecchymosis and exophthalmos may be the first sign of left adrenal neuroblastoma.*

(21) *New growths of the adrenal*
(A) *Cortex:*
(1) *Adenoma*
(2) *Carcinoma:*
(a) *Adeno carcinoma*
(b) *Fully developed*
(c) *Diffuse*
(B) *Medulla:*
(1) *Innocent:*
(a) *Paraganglioma*
(b) *Ganglioneuroma*
(2) *Malignant.*
(a) *Neuroblastoma*
(b) *Melanoma*
(c) *Metastatic.*

(22) *Results of adrenalectomy are good in post puberal virilism; but are disappointing in pre puberal virilism.*

(23) *The sexual aberrations are due to unbalance between the ovary and the adrenal, associated with a failure on the part of anterior pituitary.*

(24) There is common origin for adrenal cortex and sex gland; determination of sex takes place about the seventh week and fuchsinophil reaction commences 2–4 weeks later.

(25) The fuchsinophil substance present in the inter cellular spaces in the adrenal cortex and acting via blood stream, becomes activated at times and gives rise to male phase Virilism may be due to failure to maintain the normal balance between anterior pituitary and female adrenal, sometimes accompanied by pituitary dysfunction.

(26) *Unilateral adrenalectomy is successful in adreno genital syndrome.*

CHAPTER V

THE GONADS

(I) ANATOMY

(1) TESTIS

Structure (1) Seminiferous tubules
- (a) Spermatogonia
- ↓ (b) Spermatocytes
- ↓ (c) Spermatids
- ↓ (d) Spermatozoa

(2) Interstitial cells
- (a) First puberty 4th fœtal month
- (b) Second puberty adolescence
- (c) Third puberty senile

Functions (1) Development of sexual system
- (a) Reproductive apparatus
- (b) Secondary sexual characters
- (c) Sex psychology

(2) Effect on body growth
- Hypo-activity → gigantism + obesity

(3) Effects on other endocrines
- (a) Involution of thymus
- (b) Depression of pituitary

Control Gonadotropic hormone of ant. pituitary

(2) OVARIES

Structure (1) Graafian follicle
- (a) Ovum
- (b) Liquor folliculi

↓ (2) Corpus luteum
- Burst graafian follicle with hæmorrhage

(3) Interstitial cells

Secretions (A) Oestrin

Distribution (a) Ovary
- (b) Placenta
- (c) Fœtal membranes & liquor amnii
- (d) Pregnant urine

(B) Lutein In pregnancy
- From corpus luteum

Control Gonadotropic A and B of ant pituitary

Functions (A) *General* Oestrin
- (1) Development & maturity of sex organs
- (2) Secondary sexual characters
- (3) Nutrition of genital apparatus
- (4) Menstruation

(B) *In pregnancy* Lutein
- (1) Cessation of menstruation

(2) Embedding of ovum
(3) Development of placenta
(4) Development of breasts

(II) SEX HORMONE THERAPY

(A) FEMALE HORMONE THERAPY

(1) **Gonadal hormones · Ovarian**

(A) *Follicular hormone Oestrin*

Preparations (*a*) *Oestradiol benzoate*
(1) Dimenformon (Organon)
(2) Oestroform B (B D H)
(3) Progynon B (Schering)
Source Ovary
Dose 50 000 units intramuscular
(*b*) *Oestrone*
(1) Menformon (Organon)
(2) Oestroform (B D H)
(3) Progynon (Schering)
(4) Unden (Bayer)
Source Pregnancy urine
Routes (*a*) Oral
(*b*) Inunction
(*c*) Pessaries
(*d*) Implantation under skin
Action (*a*) Growth of female genitalia
(*b*) Secondary sex characters
(*c*) Stimulation of uterus

(B) *Luteal hormone Progesterone*

Preparations (*a*) Progestin (Organon)
(*b*) Progestin (B D H)
(*c*) Proluton (Schering)
(*d*) Lutren (Bayer)
Source Corpora lutea of sows
Dose Intramuscular 5 mg
Action (*a*) Formation of placenta
(*b*) Nutrition of embryo
(*c*) Inhibition of uterus

(2) **Gonadotropic hormones Ant pituitary**

(A) *Gonadotropic A* follicular

Preparation Anostab (Boots)
Source Pregnant mare s serum
Dose 100–200 units
Action Stimulates follicle formation

(B) *Gonadotropic B* Luteinizing

Prepar (*a*) Pregnyl (Organon)
(*b*) Antuitrin S (P D & Co)
(*c*) Gonan (B D H)
(*d*) Prolan (Bayer)

Source Pregnancy urine, placenta
Dose 100–500 units
Action Stimulates luteum formation

Indications

(1) ARREST OR RETARDATION OF PUBERTY

Syn Primary amenorrhœa

Types (A) **Primary hypogonadism**
Syn Eunuchoidism
Path (1) *Primary ovarian hypoplasia*
↓(2) Defective ovarian hormones
+(3) *Uterine hypoplasia*
Clinic (*a*) Absent secondary sex characters
(*b*) Disproportioned skeleton
(*c*) Primary amenorrhœa
Treat Gonadotropic + gonadal
Results Bad Ovary does not respond

(B) **Secondary hypogonadism**
Syn Infantilism
Types (1) *Endocrinal*
(*a*) *Ant pituitary deficiency*
Path (α) Deficient gonadotropic
↓(β) Deficient ovarian hormone
Clinic (α) Absent secondary characters
(β) *Uterine hypoplasia*
(γ) Primary amenorrhœa
Treat Gonadotropic A & B
Results Temporary
(*b*) *Hypothyroidism*
Path Secondary ovarian hypoplasia
Clinic Sex developmental defects
Treat Thyroid therapy
Results Good
(2) *Cachectic*
Etio Wasting or nutritional disease
Path Ovarian hypoplasia
Clinic Temporary retardation
(*a*) *General development*
(*b*) Sexual development
Treat Gonadotropic A

(2) DISTURBANCES OF MENSTRUATION

(A) **Secondary amenorrhœa**·
(*a*) *Simple secondary amenorrhœa*
Predisp Shock, climate
Cause (α) Pituitary deficiency
(β) Ovarian deficiency
Treat Gonadotropic + follicular

(b) *Symptomatic secondary amenorrhœa:*
Etio: (1) *General conditions:*
(α) Pulmonary tuberculosis
(β) Cachexia
(2) *Glandular diseases:*
(α) Pituitary tumours
(β) Adrenal tumours
(γ) Thyrotoxicosis
Treat: Treat the primary cause

(B) **Menorrhagia:**
(1) *Metropathia hæmorrhagica:*
Etio Young women about puberty
Cause: (a) Excess of follicular hormone
+ (b) Deficiency of corpus luteum
Treat: (a) Luteal hormone
+ (b) Gonadotropic B.
(2) *Ordinary menorrhagia:*
Treat: Gonadotropic + Luteal

(C) **Dysmenorrhœa:**
(1) *Deficient follicular hormone:*
Clinic (a) Uterine hypoplasia
(b) Scanty menses
Treat: Follicular hormone
(2) *Deficient luteal hormone:*
Path: Excessive uterine contractility
Treat: Luteal therapy

(3) CLIMACTERIC SYNDROME.

(A) **Climacteric stages:**
(1) *Increased follicular hormone:*
Path: [illegible]
Clinic. [illegible]
Treat: ([illegible]
([illegible]
(c) Luteal therapy
↓ (2) *Decreasing follicular hormone:*
Path: Uterine involution and atrophy
Clinic: Amenorrhœa
Treat: Follicular therapy
↓ (3) *Increasing gonadotropic hormone:*
Clinic: Amenorrhœa + vasomotor syndrome
Treat: Follicular therapy

(B) **Post-climacteric syndrome:**
Clinic: (a) *Atrophic senile vaginitis*
(b) *Pruritus*
(c) *Kraurosis vulvæ*

Treat Follicular hormone therapy

(4) STERILITY

Etio (1) **Uterine failure to respond to ovary**

(2) **Endocrine**

Etio (*a*) Ant pituitary

(*b*) Ovarian

(*c*) *Hypo thyroidic*

Treat (*a*) Gonadotropic A + follicular

(*b*) Thyroid therapy

(5) ABNORMALITIES OF PREGNANCY

(A) **Repeated miscarriages and abortions**

(*a*) *Prolan progesterone deficiency*

Clinic Series of miscarriages and abortions

Treat Progesterone + Gonadotropic B

(*b*) *Thyroid deficiency*

Treat Thyroid therapy

(B) **Intra uterine fœtal death**

Path Reduction of follicular hormone

Treat Follicular hormone therapy

(II) MALE HORMONE THERAPY

Hormones (1) **Gonadal hormone Testicular**

Testosterone prop onate

Prep (*a*) Testoviron (Schering)

(*b*) Neo hambreol (Organon)

(*c*) Perandren (Ciba)

Dose 25–50 mgm intramuscular

2 or 3 times a week

(2) **Gonadotropic hormones Ant pituitary**

(See under Female Hormones)

Indications

(I) ARREST OR RETARDATION OF PUBERTY

Types (A) **Primary hypogonadism**

Syn Eunuchoidism

Path (*a*) Primary testicular hypoplasia

↓ (*b*) Defective testicular hormones

+ (*c*) Defective spermatogenesis

Treat Gonadotropic + testosterone

Results Not good

(B) **Secondary hypogonadism**

Syn Infantilism

Types (*a*) *Endocrinal*

Etio (α) Anterior pituitary

(β) Thyroid

(*b*) *Cachectic*

Treat Gonadotropic + gonadal

(2) IMPOTENCE AND STERILITY

(A) **Impotence**·

Treat (*a*) Psycho therapy

(*b*) Gonadotropic + gonadal

(B) **Sterility**.

(*a*) *Defective gonadal hormone*

Path Non viable spermatozoa

Treat Testosterone

(*b*) *Defective gonadotropic hormone*

Path Aspermia or oligospermia

Treat Gonadotropic

(3) CRYPTORCHIDISM

Treat Gonadotropic B (Prolan)

Time Second dentition

(4) PROSTATIC HYPERTROPHY

Treat Testosterone

25–50 mgm 2 or 3 times a week

(III) REJUVENATION OPERATIONS

(1) Steinach

Syn Vasectomy

Ind (*a*) Sterility bilateral

(*b*) Rejuvenation

Tech (*a*) *High*

Site At the internal abdominal ring

(*b*) *Middle*

Syn Steinach I

Site External abdominal ring

(*c*) *Low*

Site At the top of the testis

(*d*) *Steinach II*

Site Between testis & epididymis

Steps (A) *Steinach I*

(*a*) Local anæsthesia

(*b*) Isolation of the vas *transfix with needle*

(*c*) Exposure of the vas

(*d*) Dissection of the vas

(*e*) Exteriorisation of the vas

(*f*) Excision of the vas 1 inch
After ligature of both ends

(*g*) Closure

(B) *Steinach II*

(*a*) Exposure of testis

(*b*) Silk ligature after crushing
Between testis and epididymis

(*c*) Closure

After treat Support

(2) Voronoff's testicular grafts

Ind (*a*) Rejuvenation

(*b*) Hypogonadism

Tech: (a) Sources: (α) Hetero: monkey, goat
(β) Homo: incomplete descent
(b) Sites (α) Tunica vaginalis
(β) Rectus sheath

IMPORTANT POINTS

(1) Ovarian hormones are responsible for uterine cycle; ovarian cycle is under the control of anterior pituitary.

(2) On the whole the results of treatment in primary and secondary developmental hypogonadism are not as satisfactory as could be desired

(3) Psychological influences do play an important part in *menstrual disorders.*

(4) In any case of simple secondary amenorrhoea in which there is a low threshold of follicular hormone, there is every indication for the employment of follicular hormone therapy.

(5) Rational treatment of any case of menorrhagia in which a failure of corpus luteum is suspected, is the administration of luteal or gonadotropic B hormone

(6) Majority of cases of endocrine sterility are the result of failure of ovulation due to anterior pituitary defect.

(7) Progesterone is responsible for the embedding of the ovum and the successful continuation of pregnancy depends on its presence in adequate quantity especially during the first four months of pregnancy.

(8) *Repeated miscarriages and abortions may result from thyroid deficiency and good results can be obtained with thyroid therapy*

(9) *Male hormone* was first extracted from testis by MacGee in 1927 and its presence demonstrated in the urine. In 1931 Butenandt prepared androsterone from urine. In 1935 Laqueur prepared testosterone from testis

(10) *Function of the testis is regulated from without by anterior lobe of the pituitary.*

(11) Testis has two functions:
  (1) Spermatogenesis
  (2) Internal secretion

(12) *There are two main groups of therapeutic hormones:*
  (a) *Gonadotropic:*
    : Stimulating the gonads
  (b) *Gonadal:*
    : Substitution therapy.

(13) Psycho-therapy is most important in male impotence.

(14) *Late descent of the testis occurs either at the second growing-up period—the time of second dentition—or at the third growing up period—puberty. Hormonal treatment is indicated just after the first period*

(15) Œstrogenic therapy:
Ind: (*a*) Menopausal syndrome
(*b*) Uterine hypoplasia.

(16) Corpus luteum therapy:
Ind: (*a*) Non ovarian sterility
(*b*) Habitual abortions
(*c*) Menorrhagia
(*d*) Dysmenorrhœa
(*e*) Eclampsia.

(17) Uterine hypoplasia:
: Alternate follicular treatment with corpus luteum therapy.

(18) *Sex changing tumours:*
(*a*) *Masculinizing tumours:*
(α) Ovario testis
(β) Pick's tubular adenoma
(γ) Arrhenoblastoma
(δ) *Adrenal hypernephroma*
(ε) Pituitary basophilism
(*b*) *Feminizing tumour:*
: Granulosal celled tumour · Theelin
(*c*) *Retarding tumour:*
: Seminoma.

(19) Testis is unisexual while ovary is bisexual; apart from progesterone, all hormones are bisexual

(20) All endocrine therapy is substitution therapy. When necessity of insulin has once arisen, it is usual to have to continue it for the rest of patient's life; so also thyroid therapy in myxœdema.

(21) *Normal onset of ovulation at puberty depends on anterior pituitary and not on ovary.*

(22) Coitus influences the pituitary to secrete a substance which stimulates follicular development in the ovary.

(23) Mammary development is also due to lutein caused by anterior lobe of the pituitary.

CHAPTER VI

THE THYMUS

(I) HYPERPLASIA

Cause Incomplete differentiation of sex glands
↓ Incomplete involution

Syndrome (1) Status thymolymphaticus

Path (a) Inadequate circulatory mechanism
(b) Thymus hyperplasia
(c) Lymphoid hyperplasia

Clinic (a) *Sudden death*
(α) *During anæsthesia*
(β) Acute infections
(γ) After trauma
(b) *Lymphoid hyperplasia*
(α) Enlarged tonsils
(β) Enlarged adenoids
(γ) Enlarged lymph nodes
(c) *Enlarged thymus*
Retro-sternal dullness
(d) *Cardio-vascular weakness*
(e) Secondary female characters
Delicate build

(2) Thymic asthma
Etio Infants
Path (a) Hyperplastic thymus
↓ (b) Recurrent laryngeal irritation

(3) Myasthenia gravis

(4) Endocrine disturbances
(a) Thyrotoxicosis
(b) Acromegaly
(c) Addison s disease

(II) PATHOLOGICAL LESIONS

(1) Dubois' abscess Congenital syphilis

(2) Thymoma (a) Infiltration
(b) Pressure syndrome

IMPORTANT POINTS

(1) *Never forget status thymolymphaticus in children who are to undergo a tonsillectomy*

(2) *Screen every child for enlarged thymus before any operation under general anæsthesia*

(3) Retro sternal dullness of more than usual magnitude raises the suspicion of hyperplastic thymus.

(4) *Beware of delicate graceful children, they may be victims of status thymolymphaticus*

CHAPTER VII

THE PANCREAS

(See under Diabetes in Surgery)

SOME GENERAL STATES

CHAPTER I

SHOCK

Def: (A) **Shock:**
: **General depression of vital functions,** associated with low blood pressure

(B) **Collapse:**
: **Sudden failure of vital functions,** due to cardiac or respiratory damage, hæmorrhage or vasomotor anæmia

(C) **Syncope:**
: **Temporary inhibition of vital functions,** produced by anæmic state of the brain

Types: (1) **Primary or nervous shock:**
: Cardiac inhibition of vagus

(2) **Secondary or toxic shock:**
: Absorption of histamine

(A) **Hæmatogenic shock:**
Syn: Shock hæmorrhage complex
Path: Loss of circulating blood

(B) **Neurogenic shock:**
Syn: Emotional shock
Path: Loss of central tone

(C) **Vasogenic shock:**
Syn: Histamine shock
Path: Loss of peripheral vascular tone

Etio: (1) *Predisposers:*

(A) **Exposure and attrition:**
- (*a*) Cold
- (*b*) Dehydration
- (*c*) Starvation
- (*d*) Exhaustion
- (*e*) Debility

(B) **Mental and physical stress**

(2) *Exciting:*

(A) *Primary shock:*
- (1) Disturbances of higher nerve centres
  : **Mental shock**
- (2) Blows on thorax and abdomen:
  : **Sympathetic plexus shock**
- (3) Manipulations & exposure of viscera
  : **Sympathetic sensory shock**
- (4) Trauma to large nerve trunks:
  : **Peripheral sensory shock**

(5) Trauma to central nervous system:
: **Central nervous shock**
(6) Depletion of blood volume.
: **Hæmorrhagic shock**

(B) *Secondary shock:*
(1) Extensive laceration of tissues:
: **Histamine shock**
(2) Acute infections:
: **Toxic shock**

(C) *Mixed shock:*
(1) Extensive cutaneous lesions, burns
. Sensory + toxic
(2) Extensive serous membrane lesions:
. Sensory + toxic

Path: (1) Direct effect from *higher nerve centres*
or (2) Over stimulation of *sensory* apparatus
or (3) Over stimulation of *sympathetic* nerve ganglia
or (4) Direct *injury* to central nervous system
or (5) *Loss of blood*
or (6) *Toxic* or histamine absorption
↓ (7) **Inhibition or fatigue-paralysis:**
: Of vasomotor centre
↓ (8) **Capillary and venous paralytic stasis:**
(a) Stagnation
↓ (b) Anoxæmia
↓ (c) Endothelial damage
↓ (d) Transudation
↓ (e) Increased viscosity
↓ (f) Stagnation
↓ (9) Empty heart and arteries
+ (10) **Diminution in blood volume**
↓ (11) *Fall in blood pressure*
↓ (12) *Ischæmia of vital centres*
↓ (13) *Depression of all vital functions*

Morb. anat: (1) Capillary stasis
↓ (2) Diminution in blood volume
↓ (3) Low blood pressure
↓ (4) Anæmia of brain

Clinic: (1) **Mental:**
(a) Torpor
(b) Anxiety
(c) Excitement
(d) Delirium
(e) Apathy: to self and surroundings
(f) Semi consciousness
(g) *Absent pain*
(2) Musculature:
: Relaxation

(3) Respiration :
: Slow and shallow
(4) **Pulse :**
: *Weak, rapid, running*
(5) **Temperature :**
: *Subnormal*
(6) **Skin :**
: *Cold*, clammy, leaden grey
(7) Sphincters :
: Relaxed
(8) Thirst and **perspiration**
(9) **Fall in blood pressure :** $<$ *80 mm.*

Treat : (A) *Prophylactic.*
(1) **Mental :**
. *Re assurance*, optimism
(2) **Sedatives :**
: *Morphia*, bromides, chloral
(3) **Warmth :**
: *Warm clothing*, hot drinks
(4) **Food and fluids :**
(*a*) Avoid starvation
(*b*) *Glucose therapy*
(*c*) Hydro therapy
(5) **Anæsthesia :** *Anoci association*
(*a*) Local
(*b*) Regional
(6) **Delicate handling**

(B) *Curative :*
(1) Rest in bed
(2) **Reversed position :** (head low)
(3) Warmth .
(*a*) Warm blankets
(*b*) Hot water bags
(*c*) **Electric cradle**
} Temp not above 95° F.
(4) Narcotics :
: **Morphia**
(5) Peripheral vaso constrictors :
(*a*) Intravenous **adrenaline**
(*b*) Pituitrin
(6) **Infusion :** Saline or blood plasma
Tech (*a*) Subcutaneous
(*b*) Intravenous
(*c*) Rectal :
: Normal saline or tap water
(*d*) Intraperitoneal
Ind : Dehydration
Contraind : (*a*) *Uncontrolled internal hæmorrhage*
(*b*) Anæmia

(c) High blood pressure
(d) *Decompensated heart*
(e) *Lung condition*

Additions: (a) Glucose: 25 c.cs of 25%
(b) Gum acacia: 6% in normal saline
(c) Adrenaline: 1 in 50,000

(7) **Blood transfusion**
(8) Mechanical pressure:
(a) Limb bandages
(b) Pneumatic suit

(C) *Operations under shock:*
(1) **Conservative treatment:**
Ind: Till blood pressure rises
Tech: (a) Inject morphia
(b) Posture
(c) Heat
(d) Saline infusion
(e) Blood transfusion
(f) Local treatment:
(α) Arrest hæmorrhage
(β) Inject novocain in nerves
(γ) Tourniquet to prevent toxæmia

(2) **Immediate operations:** Inspite of shock
(a) *Severe internal hæmorrhage*
(b) *Rupture or perforation of hollow organ*
(c) *Trauma to central nervous system:*
(a) Depressed fracture skull
(b) Intracranial hæmorrhage
(d) *Secondary toxic shock*

CHAPTER II

ACIDOSIS

Def: *Decrease in the alkali reserve of blood*

Physio: The amount of soda bi-carb present in blood is termed the alkali reserve

Estimation: **Van Slyke's** method:

: Measure CO_2 present in the blood or plasma, which has been exposed to CO_2 at a pressure of 40 m m. of mercury

(a) Normal CO_2 content of blood:
: 40–45 vols. per 100 c.cs of blood

(b) Normal CO_2 content of plasma:
: 55–70 vols. per 100 c.cs. of blood

Causes: (A) Increase in carbonic acid:

(a) Morphine poisoning:
: Depressed respiratory centre

(b) Bronchial obstruction:
: Accumulation of CO_2 in blood

(B) **Decrease in alkali reserve:**

(a) Administration of acids and acid salts

(b) **Uræmia:**
: Deficient excretion of acids

(c) **Diabetic coma:**
: Ketosis

(d) Carbohydrate starvation: ketosis
(α) Cyclic vomiting
(β) Pregnancy vomiting
(γ) Anæsthetic vomiting

Path: pH blood: 7·25 or 7·30

Alkali reserve 30—25 vols of CO_2 per 100 c.cs.

Alveolar CO_2: 2—1·5%

Clinic: (1) **Thirst + dry tongue**
(2) **Vomiting**
(3) **Air hunger** + breath odour
(4) Nervous syndrome.
(a) Headache
(b) Irritability
(c) Restlessness
(d) Delirium
(e) Drowsiness
(f) **Coma**

CHAPTER IV

DELIRIUM

(1) DELIRIUM NERVOSUM

Syn. Traumatic delirium

Predisp. Instability of nervous equilibrium
- (a) Chronic alcoholism
- (b) Sexual excess
- (c) Senility

Etio. (a) **Operations: on genitalia**
- (b) Accidents

Clinic. (1) Maniacal
- (2) Low muttering type
- (3) Melancholic

Compl: Chronic insanity or dementia

Treat. Symptomatic

(2) TOXIC DELIRIUM

Types: (A) ***Infective:*** *Pyogenic toxæmia*

Clinic: (a) 3 to 5 days after operation
- ↓ (b) Toxic absorption
- ↓ (c) Active restless delirium
- ↓ (d) Typhoid state

(B) **Chemical:** Iodoform

Clinic: (a) Nervous syndrome
- (1) Excitement → hallucinations
- ↓ (2) Depression → coma
- \+ (b) Circulatory syndrome:
  - . Rapid, weak pulse
- \+ (c) Alimentary syndrome
  - : Diarrhœa

Treat: (1) Treat the cause
- (2) Sedatives
- (3) Symptomatic

(3) DELIRIUM TREMENS·

Predisp: **Chronic alcoholism**

Exciting: (1) Severe trauma
- (2) Operation
- (3) Hospitalisation.
  - : **Deprivation of usual dose of alcohol**

Cause: Sudden withdrawal of alcohol from an individual who for a long time has been accustomed to its regular use.

Clinic: (1) Latency: upto 3 days

↓ (2) Prodromal syndrome

(a) **Insomnia**

(b) Restlessness

(c) **Incoherent talkativeness**

(d) **Tremors** and twitchings

(e) Anorexia

(f) Toxæmia

↓ (3) Active stage: sthenic

(a) Restlessness

(b) Incoherence

(c) **Hallucinations:**

(α) Sight

(β) Hearing

(γ) Persecution

(d) **Insensibility to pain**

(e) Toxic exhaustion

↓ (4) Stage of exhaustion: asthenic

: Typhoid state

Compl. (a) Delusional insanity

(b) Dementia

Treat: (1) *Allow a small regular quantity of alcohol*

(2) Purge and laxative

(3) Sedative:

: Paraldehyde, bromide, chloral

(a) ℞. Chloral hydras } Pot bromide } āā grs. xv

(b) ℞. Pot. bromide grs. xxx

Chloral hydras grs. xx

Tr. hyoscyamus m. xxx

Aqua menthæ pip. qs. ad. ounce I

(c) ℞. Veronal grs. x every 2 hours

(d) ℞ Hyoscine hydrobrom. 1/100 gr.

(4) Mechanical restraint:

(a) Plasters for fractures

(b) Quiet room

(c) Preliminary hot bath or cold pack

(d) Rest in bed

(e) Nourishing food

(4) NERVOUS TRAUMATIC DELIRIUM

: (See under *Trauma to Head*)

(5) PSYCHOGENIC DELIRIUM:

Etio: Hypochondriasis, hysteria.

CHAPTER V

SURGICAL PYREXIA

(I) ASEPTIC TRAUMATIC FEVER:

Etio: (1) Undrained operation or trauma
(2) Extravasation of blood

Predisp: (*a*) Contusions
(*b*) Hæmatomas
(*c*) Lacerations
(*d*) Extravasations

Path. *Absorption of fibrin ferment*

Clinic: (*a*) Start within 24 hours
(*b*) Pyrexia not above 100° F.
(*c*) Normal within 72 hours

Treat: (1) Aperient
(2) Suitable diet

(II) INFECTIVE FEVERS,

Def: Pyrexia caused by toxins of bacteria

Types: (A) *Infective traumatic fever*:

Syn Non specific septic fever

Types (*a*) **Toxic fever:**

Clinic. (1) Begins about 3rd day
(2) Marked toxic pyrexia
(3) Acutely inflamed wound

(*b*) **Septic intoxication:**

Etio: Very severe sepsis

Clinic. (1) Sthenic
High temperature
(2) Asthenic:
: *Cardiac failure*

(*c*) **Chronic sepsis:**

Etio Undrainable infective focus

Clinic (*a*) Intermittent temperature
(*b*) Toxic cachexia

Treat. Free drainage

(B) *Specific infectious fevers*:

Treat: Specific antisera

(C) *Toxæmia*:

Def: Circulation of toxins in blood

Types: (*a*) Microbic.
(α) Non specific
(β) Specific
(*b*) Proteolytic

Etio: (a) Local septic focus
(b) Tissue destruction

Path: (a) Blood: (α) Hæmolysis → icterus
(β) Secondary anæmia
(b) Heart. (α) Fatty degeneration
(β) Dilatation
(c) Lungs: congestion → inflammation
(d) Liver: enlarged + degeneration
(e) Spleen: enlarged
(f) Kidneys: enlarged
(g) Intestines: catarrh → ulceration

Clinic (1) Pyrexia:
(a) Remittent or intermittent
(b) High or low
(2) Anæmia + icterus
(3) Cachexia + asthenia
(4) Nervous syndrome:
Toxic shock
(5) Alimentary syndrome
: Septic diarrhœa
(6) Urinary syndrome:
: Albuminuria
(7) Respiratory syndrome
. Septic broncho-pneumonia

(D) *Sapræmia*:

Def: Blood poisoning due to absorption from a wound, *of bacterial products*

Types: (1) **Infective traumatic fever**
: (See above)
Syn. Surgical fever
Cause: Parasitic absorption
Time: Post operative third day
Clinic (a) Toxic pyrexia:
. High and without
(b) Acutely inflamed
(2) **Septic intoxication**:
: (See above also)

(c) Focus of infection under tension
(d) Ulceration into a bloodvessel

Bact (a) **Streptococcus**
(b) Staphylococcus
(c) Pneumococcus
(d) B Coli
(e) B Pyocyaneus

Clinic (1) **Terminal septicæmia**:
(a) Long continued infective toxæmia
↓(b) High pyrexia with rigors
With (α) Hæmolysis
(β) Diarrhœa
(γ) Uræmia
(δ) Lung congestion
+(c) Blood culture +

(2) **Temporary septicæmia**:
(a) Pre existing suppurative focus
↓(b) Inadequate drainage
↓(c) Septic pyrexia
+(d) Blood culture +

(3) **Established or primary septicæmia**:
Etio (a) ***Virulent bacteria***
(α) Streptococci
(β) Pneumococci
(b) ***Trivial primary focus***
(α) Punctured wound
(β) Closed focus under tension
(c) ***Deficient resistance***
(α) Non specific
Diabetes, nephritis
(β) Specific

Clinic (1) *Sthenic type*
(a) Rigors
(b) Sudden high pyrexia
(2) *Asthenic type*
Cause Overwhelming infection
Clinic (a) Toxic shock
(b) Toxic delirium

Diag (a) Insignificant focus
(b) Lymphangitis
(c) Sepsis syndrome + +
(d) Blood examination
(α) Blood count
(β) Blood culture

(4) **Chronic septicæmia**:
Etio; Chronic suppurative focus

Excit: (*a*) Obstructed drainage
(*b*) Lack of rest

Clinic: (*a*) Intermittent fever:
: With rigors
(*b*) Toxic cachexia

(F) *Pyæmia*.

Def: Circulation of *pus droplets in blood*, leading to metastatic abscesses

Types (1) **Acute pyæmia:**

Etio. (*a*) Acute suppurative osteomyelitis
(*b*) Sinus thrombo phlebitis
(*c*) Sinusitis
(*d*) Abscess under tension

Bact: (*a*) *Staphylococcus*
(*b*) Streptococcus
(*c*) Pneumococcus

Path (*a*) Primary focus
↓ (*b*) Infected thrombus
↓ (*c*) Septic embolism
↓ (*d*) *Metastatic abscesses:*
(1) Serous cavities
(2) Joints
(3) *Muscles*
(4) *Areolar tissues*
(5) Lungs

Clinic (*a*) Primary suppurative focus
+ (*b*) Toxæmia
↓ (*c*) Rise in pyrexia:
: With or without rigors
+ (*d*) Insidious appearance of abscess:
(α) Subcutaneous tissues
(β) Intermuscular planes
(γ) Joints
(δ) Pleuræ and lungs
+ (*e*) Pronounced toxæmia

(2) **Chronic pyæmia:**

Etio: Primary focus in:
(*a*) Teeth. pyorrhœa alveolaris
(*b*) Tonsils: septic tonsillitis
(*c*) Nasal sinuses sinusitis
(*d*) Middle ear: otitis media
(*e*) Anal canal: cryptit

Clinic; (*a*) Rigor -> pyrexia
(*b*) Multiple succeeding
(α) Subcutaneous
(β) Intermuscular

(3) **Portal pyæmia:**

Etio Alimentary canal focus:
(a) Acute appendicitis
(b) Inflamed piles

Path: (a) Primary focus
↓ (b) Thrombo phlebitis
↓ (c) Pylephlebitis
↓ (d) Portal pyæmia

Clinic. (a) Primary focus. alimentary
(b) *Septic fever. with rigors,*
(c) Tender enlargement of liver
(d) Jaundice
(e) Toxic anæmia + cachexia

(G) *Amyloid or lardaceous disease:*

Syn Waxy disease

Def: Deposition of amyloisin or lardacein:
: Around the blood vessels of viscera

Etio Chronic suppurative focus:
(a) Bone
(b) Joint
(c) Thorax

Path Deposition of amyloisin or lardacein in the walls of arterioles, which stains mahogany brown with iodine and causes smooth enlargement of kidneys, liver, spleen and intestines.

Clinic (1) Kidneys polyuria, albuminuria, enlargement
(2) Intestines diarrhœa
(3) Liver smooth enlargement
(4) Spleen smooth enlargement
(5) General *toxæmia and cachexia*

Treat (a) Treat the original focus
(b) General hygiene

Blood examination in septic pyrexias:

(A) **Microscopical:** Leucocytosis
(a) Total:
(α) Inflammation 8,000–15,000
(β) *Suppuration Above 20,000*
(b) Polymorphs
Above 85% in suppuration
(c) Lymphocytosis:
: Chronic granulomas
(d) Eosinophilia:
. Animal parasitic infection

(B) **Cultural**

Treatment in septic pyrexias:

(1) **Treat the local condition;**
(a) Excision in toto

(*b*) Drainage
(*c*) *Ligature of efferent vein : prophylactic*

(2) **General :**

(*a*) Specific : antisera, vaccines
(*b*) Non specific : chemo therapy
(*c*) Supportive hydrotherapy, glucose,
: blood transfusions

(III) CENTRAL NERVOUS FEVERS :

Etio : Cerebral trauma or operation
Cause : Pontine hæmorrhage
Clinic : (*a*) Hyperpyrexia
+ (*b*) Pin point pupils
Path : Interference with thermogenic centres
Treat : (1) Conservative .
: Tepid or ice packs.

CHAPTER VI

JAUNDICE AND CHOLÆMIA

(1) OBSTRUCTIVE HEPATIC JAUNDICE:

: Immediate *direct* Van den Bergh

Signs: (*a*) **Bile-staining** of all tissues:
- (1) ***Yellow***
- ↓ (2) Orange
- ↓ (3) Olive
- ↓ (4) Green
- ↓ (5) *Gray*
- ↓ (6) Black

(*b*) **Urine: Bile pigments and salts**

(*c*) **Acholic stools**: Pale, bulky, offensive

(*d*) Nervous syndrome:
- (α) **Pruritus**
- (β) Irritability
- (γ) Drowsiness

(*e*) Blood and circulation:
- (α) **Slow pulse**
- (β) Greater resistance of R. B C.s to hypo saline
- (γ) *Prolongation of coagulation time*

(*f*) **Enlarged liver**

Diag: Immediate direct Van den Bergh

Causes: *Obstruction to biliary ducts*:

(A) *Lumen*:
- (1) **Biliary mud**: Catarrhal jaundice
- (2) **Gall stone**
- (3) Round worm or liver fluke

(B) *Duct wall*:
- (1) **Cholangitis**: Catarrhal jaundice
- (2) Stenosis
- (3) *Carcinoma*

(C) *External pressure*:
- (1) **Chronic pancreatitis**
- (2) **Carcinoma**:
  - (*a*) Pancreas
  - (*b*) Gall bladder
  - (*c*) Pylorus
  - (*d*) Kidney
  - (*e*) Liver
- (3) *Enlarged portal glands*:
  - (*a*) Malignant

(b) Leukæmic
(c) Lymphadenomatous
(d) Tuberculous
(4) Adhesions
(5) Mobile kidney. kinked duct

Clinic: (A) **Gall stone jaundice:**
(a) Type of patient
(b) Gall bladder dyspepsia
(c) Recurrent biliary colic
(d) Intermittent hepatic fever
(e) *Gall bladder not palpable*
(f) *Jaundice*: (α) *Intermittent*
(β) *Fluctuating*
(g) X Rays

(B) **Malignancy jaundice:**
(a) *Jaundice:*
(1) *Persistent*
(2) *Progressive*
(3) Ingravescent
(4) Painless
(5) Intense
(b) Rapid progressive wasting
(c) *Gall bladder enlarged*
(d) Liver enlarged
(e) Stools
(1) Absence of bile
(2) Absence of pancreatic digestion

(2) HÆMOLYTIC JAUNDICE. *Indirect* Van den Bergh

Path: (a) Excessive blood destruction
↓ (b) Excessive retention of bilirubin

Causes: (1) **Acholuric familial jaundice:**
: (See page 1476)
(2) **Pernicious anæmia**
(3) **Icterus neonatorum**
(4) **Excessive hæmolysis:**
(a) Septicæmia
(b) Erroneous transfusion

(3) TOXIC OR INFECTIVE HEPATIC JAUNDICE:
: *Biphasic* Van den Bergh

Causes: (a) **Catarrhal jaundice:**
Syn: Infective hepatitis and cholangitis
Clinic: (1) Vague gastro intestinal symptoms
(2) Pyrexia
(3) Slight jaundice:
(a) Pruritus
(b) Bradycardia

(c) Stools (α) Pale
(β) Offensive
(γ) Bile pigment
(4) Tender enlargement of liver
(5) *Duration not more than 6 weeks*

(b) **Infective illnesses:**
(α) Typhoid
(β) Pneumonia
(γ) Septicæmia
(δ) Eclampsia

(c) **Syphilis:** Congenital and acquired
(d) **Arsenobenzol** poisoning
(e) Delayed **Chloroform** poisoning

Summary of causes of jaundice:

(1) *Obstructive or surgical jaundice:*

(A) *Within the lumen*
(a) **Inspissated bile**
(b) **Gall stones**
(c) Parasites

(B) *Walls of the ducts*
(a) **Catarrh:** (α) Duct walls
(β) Ampulla of Vater
(γ) Pancreas
(b) Carcinoma
(c) Cicatrization
(d) Congenital

(C) *Pressure from outside*
(a) Peritoneal adhesions
(b) Enlarged portal glands
(c) New growths of:
(1) Liver
(2) **Pancreas**
(3) **Gall bladder**
(4) Duodenum
(5) **Stomach**
(6) Colon
(7) Right kidney
(8) Omentum
(d) Hepatic arterial aneurysm
(e) **Chronic pancreatitis**
(f) Retro peritoneal abscess or cyst or tumour:
(α) Perinephric
(β) Subphrenic

(D) *Traction and kinking:*
: Visceroptosis.
(a) Mobile kidney
(b) Mobile duodenum

(II) *Non obstructive or medical jaundice :*

(A) *Diseases of the liver :*
(1) Congestion
(2) **Cirrhosis**
(3) Carcinoma
(4) **Acute yellow atrophy**
(5) Syphilis
(6) Abscess

(B) *Acute fevers and infections :*
(1) Malaria
(2) Typhoid
(3) Influenza
(4) Pneumonia
(5) Tropical fevers
(6) Septicæmia or pyæmia

(C) *Poisons*
(1) **Chloroform**
(2) **Arseno benzol**
(3) Phosphorus
(4) Snake poison

(D) *Blood diseases*
(1) Icterus neonatorum
(2) Acholuric jaundice
(3) Familial jaundice
(4) Pernicious anæmia
(5) Splenic anæmia
(6) Leukæmia
(7) Lymphadenoma
(8) Paroxysmal hæmoglobinuria

(E) *Nervous :*
: Concussion

Diagnostic methods in jaundice :

(1) **Careful history :**
(a) Age
(b) Pregnancy
(c) Chemicals
(d) Family history

(2) **Symptomatology :**
(a) Dyspepsia and pain
(b) Jaundice
(c) Fever

(3) **Physical examination :**
(a) Liver
(b) Gall bladder
(c) Spleen
(d) Pancreas head
(e) Stomach and duodenum

(f) Peritoneum
(g) Rectum

(4) **X-Rays**·
Plain X Rays, **no cholecystography**

(5) **Stools:**
(a) Naked eye colour, smell, bulk
(b) Pancreatic deficiency
(c) Biliary deficiency
(d) Blood
(e) Cysts or vegetative forms of E. Histolytica

(6) **Urine:**
Bile pigments and salts

(7) **Blood.**
(a) Blood count total and differential
(b) Wassermann or Kahn
(c) Van den Bergh
(d) R B Cs. fragility
(e) Icteric index
(f) *Coagulation time*
(g) *Bleeding time*

Factors in differential diagnosis of causes of jaundice·

(I) **Age, sex and history:**
(A) Age
(a) New born icterus neonatorum
(b) Infants (α) Familial acholuric
(β) Syphilis
(c) Before 30 catarrhal
(d) After 30 gall stones
(e) *After 40* carcinoma
(B). Sex
Females (a) Gall stones
(b) Pregnancy liver necrosis
(C) History of arsenicals

(2) **Colour:**
(A) Hæmolytic (a) Lemon yellow
(b) *Conjunctivæ unaffected*
(B) Hepatic necrosis bright yellow
(C) Obstructive (a) Dirty yellow
(b) Greenish yellow

(3) **Course:**
(A) Short duration (a) Catarrhal
(b) Passing gall stone
(B) Progressive· (a) Carcinoma
(b) Chronic pancreatitis
(C) Intermittent: gall stones

(4) **Gall bladder:**
(A) Jaundice + gall bladder enlarged:
: Carcinoma or chronic pancreatitis
(B) Jaundice + gall bladder not enlarged:
: Stones in ducts
(C) Gall bladder enlarged + no jaundice:
: Stones in gall bladder or cystic duct

(5) **Liver enlargement:**
(A) Irregular growth, cirrhosis
(B) Smooth obstruction to duct, congestion

(6) **Stools:**
(A) White obstructive jaundice
(B) Yellow hæmolytic or toxic jaundice

(7) **Pain:**
(A) Constant growth
(B) Attacks stone colic
(C) Absence toxic or catarrhal or growth

(8) **Syphilis:**
(A) Disease proper
(B) Arseno benzol treatment

CHOLÆMIA OR HEPATIC FAILURE:

Cause. Loss of detoxifying function of the liver cells for amino acids
Etio: Unrelieved chronic obstructive jaundice
Path: Fatty degeneration + necrosis + hæmorrhage
Clinic: (*a*) Onset acute or insidious
(*b*) Neuro muscular syndrome
(*c*) 'Typhoid state' toxæmia
(*d*) Jaundice
(*e*) Hyperpyrexia
(*f*) Intractable vomiting
: With hæmatemesis
(*g*) Hæmorrhages

Types. (1) Medical cholæmia
(2) ***Post-operative cholæmia:***
Cause: Hepatic inadequacy due to:
(*a*) Deranged liver
+ (*b*) Effects of:
(1) Anæsthesia
(2) Trauma
(3) Shock
(4) Hæmorrhage
(5) Toxæmia
(6) Starvation & dehydration
Clinic: (1) Rapid death: within 48 hours
(2) Delayed death: within 4 or 5 days
(3) Renal death: cholæmia + anuria

Clinic synd · (1) **Liver acidosis:**
Clinic (*a*) Vomiting
(*b*) Prostration
(*c*) Air hunger + hay smell
(*d*) Acetonuria

(2) **Primary liver failure:**
Syn White bile
Clinic (*a*) Vomiting
(*b*) Prostration + weakness
(*c*) Restlessness
(*d*) Thin white bile

(3) **Secondary renal failure:**
Clinic (*a*) Bile less
(*b*) Jaundice more
(*c*) Circulatory failure
(*d*) Drowsiness → coma
(*e*) Blood urea rise

Liver function tests

(A) *Blood*
(1) **Van den Bergh** ·
Test for bilirubin by diazo reagent
(*a*) Direct (α) Immediate obstructive
(β) Delayed
(γ) Biphasic infective
(*b*) Indirect hæmolytic
(2) Fouchet
Ferric chloride + trichloracetic acid
(3) Icterus index:
· Plasma against potassium bichromate

(B) *Urine*
(1) *Bile salts and pigments*
(2) Nitrogen coefficient
(3) Ammonia coefficient

(C) *Stools*
. For bile and pancreatic ferments

(D) *Lævulose tolerance test*

(E) *Galactose tolerance test:*
(1) Infective jaundice:
(*a*) Galactosuria
+ (*b*) Hyper glycæmia
(2) Hæmolytic or obstructive jaundice ·
No hyper glycæmia or galactosuria

(F) *Intravenous*
(*a*) Phenol tetra chlor phthalein
or (*b*) Brom sulphalein
↓ Examine. (*a*) Stools
(*b*) Duodenal contents
(*c*) Blood

(G) *Cholecystography : dangerous in jaundice*
(H) *Duodenal intubation :* Meltzer-Lyon test

Treatment of jaundice :

(I) *Medical treatment :*

(1) **Rest in bed**

(2) **Diet :**
- (a) Plenty of **carbohydrates** ; glucose, cane sugar
- (b) Plenty of **fluids**
- (c) No fats

(3) **Bowels :**
- (a) **Calomel :** ¼—½ gr. hourly for 6 doses
- ↓ (b) Saline purge : 12 hours after
- (c) **Mag. sulph :** Drachms 2 every morning
- (d) Ice cold enema
- (e) Direct trans duodenal biliary drainage :
  : By Einhorn tube

(4) **Cholagogues and biliary antiseptics :**
- (a) Hexamine grs 30
  Helmitol grs. 15
  Felamine
- (b) Calomel ; pil. hydrargyri
- (c) Belladonna
- (d) Alkalies

(5) **Symptomatic :**

(A) Gastric irritation :

: ℞ Bismuth salicylas	grs.	xv
Soda bi-carb	grs.	xv
Tr. belladonna	m.	v
Acid hydrocyanic dil.	m.	iii
Tr. aurantii	m.	xx
Aqua chloroformi	ad. ounce	1
	every four hours	

(B) Cholangitis :
- (a) Local fomentations
- + (b) Subcutaneous injections :
  - (α) Atropine sulph. 1/100 gr.
  - + (β) Adrenaline hydrochlor. 5 min.

(C) Pruritus :
- (a) Alkalies by mouth
- (b) Alkaline bath
- (c) Calamine ointment
- (d) Thyroid extract
- (e) Sedatives

(6) **Cholæmia :**

(A) **Glucose-insulin :**
- (a) 5–10% glucose-saline ; any route

CHAPTER VII

DIABETES IN SURGERY

Etio: (1) Age above 40
(2) Well-to do class
(3) Faulty diet
(4) Secondary to ductless glands

Path: *Effects of diabetes on surgery:*

(1) *Susceptibility to infection:*

(a) **Skin infections:**
: Eczema, dermatitis
(b) *Boils and carbuncles:* (See under Skin)
(c) Pyogenic abscesses
(d) Cellulitis: (See under Skin)
(e) Pyæmia and septicæmia
(f) *Gangrene.*

Def: Gangrene in a diabetic patient

Etio: Any trauma, even slight

Site: ***Lower extremity:*** *toes → foot → leg*

Path: (a) Arterio sclerosis
(b) Peripheral neuritis
(c) Lowered tissue vitality
(d) Focal sepsis

Clinic. (1) Dry, aseptic gangrene
or (2) **Septic, moist gangrene:**
(a) Marked inflammation
(b) Rapid progress
(c) Rapid extension
\+ (3) Septic intoxication
\+ (4) *Glycosuria + glycæmia*

Compl. (a) **Diabetic coma**
(b) **Septic intoxication**
(c) Exhaustion
(d) *Lung complications:*
(α) Broncho pneumonia
(β) Embolism
(e) Cardio vascular sclerosis

Treat: (A) **Conservative:**
Ind: (a) Localised dry gangrene
(b) Non spreading infection
(c) No intense pain
(d) No high temperature

(B) **Operative:**
Ind: (a) Spreading infection

(b) No improvement:
. After 3 weeks
(c) Prolonged pain
(d) Septicæmia
(e) Exhaustion
Prep. (1) Glucose
(2) Insulin
(3) Soda bi carb
Oper Amputation
Site. (a) Well above the knee
(b) Well clear of sepsis
Tech. (1) One stage
(2) Two stages
(A) { (a) Femoral sympathectomy
(b) Femoral vein ligature
↓ (B) Low amputation

(2) *Delayed healing:*
Causes: (a) Susceptibility to infection
(b) Low regenerating power
(α) Arteriosclerosis
(β) Peripheral neuritis

(3) *Effects of surgery*·
Factors: (A) **Anæsthesia**
(B) **Cardio-vascular changes**
(C) **Operative trauma**
Effects: (A) **Local spread of sepsis**
(B) **Septic toxæmia**
(C) **Acidosis and diabetic coma:**
Etio. (a) Dehydration
(b) Dietary infractions
(c) Omission of insulin
(d) Infection
(e) Anæsthesia
(f) Operative trauma
Clinic· (See under Acidosis)

Management of surgical diseases in diabetes:

(I) CHRONIC CASES·
(A) *Pre operative treatment:*
(a) **Investigations:**
(1) Urine analysis.
(α) Sugar
(β) Aceto acetic acid and acetone
(2) Blood sugar estimation
(3) Blood pressure
(b) **Diet and insulin:**
(1) Liberal allowance of carbohydrates:
(α) Milk

(β) Juice of: (1) **3 or 4 oranges**
(2) 1 or 2 grape fruits
(3) **1 or 2 bananas**

(2) **Insulin:** Units as required

(3) **Plenty of fluids:**

(α) Oral
6 ounces of water or broth or coffee or milk or orange juice every hour

(β) Rectal
(1) 5% glucose } 6 ounces at a time
(2) Tap water }

(B) *Just before the operation*

(a) **25 units of insulin: subcutaneous**

↓ (b) **50 gms. of glucose: intravenous**

(C) *Operative precautions*

: **Anæsthesia:**

Give (1) Spinal
(2) ***Regional** or local*
(3) Gas and oxygen
(4) Avertin
(5) **Sodium evipan**
(6) **Cyclopropane**

Avoid (a) *Chloroform*
(b) Ether

(D) *Post operative treatment.*

(a) **Hydrotherapy:**
Mouth, *rectum*, veins

(b) **Glucose + insulin:**
2 gms of glucose to 1 unit of insulin
Veins, mouth, rectum

(c) **Diet:**
Milk + orange juice + banana

(d) **Keep a watch for coma**

(II) ACUTE CASES

(A) *Pre operative treatment*

(a) ***Investigations:***
(α) Urine
(β) *Blood*
(γ) Blood pressure

(b) **Diet and insulin:**
(α) Plenty of fluids·
· By all available routes
(β) **100 gms. glucose + 50 units insulin**

(B) *Operative precautions:*

(a) Avoid general anæsthesia
(b) Prevent shock

(C) *Post operative treatment:*

(a) **Investigations:**

(1) **Urine analysis: every three hours**
(2) Blood sugar estimation

(b) **Diet and insulin:**

: **Milk + glucose + insulin:**

(a) 2 gms glucose to 1 unit insulin:
. Every 4—6—8 hours
: Till urine is sugar free

↓ (β) Sugar alone orange juice ounce ½

(c) **Plenty of fluids:**

: By all available routes

(III) COMPLICATIONS

(A) *Diabetic coma*

Treat: (1) **Purge:** Calomel or castor oil

(2) **Soda-bi-carb:**

(a) One teaspoonful in 5 ounces of water.
, Every hour by mouth
: Till urine is alkaline

(b) **Infusion of 2-3 pints of 3% solution**

(3) Keep warm

(4) Insulin·
: 50-100 units subcutaneous straight

(5) **2 ounces dextrose + 50 units insulin**

↓ (6) Examine urine for sugar every 3 hours

↓ (7) If 6th hour urine contains sugar:
: Give pure insulin 30-50 units

or (7) If 6th hour urine contains no sugar.
: Give 2 gms. glucose to 1 unit insulin

(8) **Hydrotherapy:**

(a) **Oral water 10 ounces per hour**
(b) 600 c cs normal saline every 3 hours
(c) 20% glucose every 3 hours

Prognosis: (a) Age of the patient: worse after 40
(b) Degree of coma
(c) Presence of infection

(B) *Hypoglycæmia:*

Clinic: (a) Prostration and nervousness
↓ (b) Collapse
↓ (c) Delirium
↓ (d) Convulsions
↓ (e) Coma

Diff. diag:

Clinic	*Diabetic*	*Hypoglycæmic*
Onset	gradual	sudden
Skin	flushed, blue, dry	white, sweating
Tongue	dry	moist
Breath	*acetone smell*	*no smell*
Respirations	deep	shallow
Pulse	rapid, feeble	bounding
Eye tension	*low*	*normal, raised*
Urine	sugar + acetone	no sugar or acetone
Blood sugar	*over 200 mgm.*	*below 70 mgm.*
Blood pressure	*low*	*normal*

Treat: (1) *Stop insulin*
(2) Orange juice 2–4 ounces by mouth
(3) *Glucose: by all available routes*
(4) Injections.
(a) *Adrenaline*. 1 c.c. subcutaneous
(b) Pituitrin: 1 c.c. intramuscular

CHAPTER VIII

ANURIC URÆMIA

Def: Retention of urea and nitrogenous products in blood, due to their defective excretion by the kidneys

Etio: (1) **Shock or acidosis**

(2) **Hepatic failure**

(3) **Reflex anuria:**

(a) Urethra: instrumentation
(b) Bladder. lithotomies
(c) Ureter. impacted stone
(d) Kidney. inflammation

(4) **Infective anuria:**

(a) Hæmatogenous.
(α) Toxic: pneumonia, typhoid
(β) Bacterial. septicæmia
(b) *Ascending urinary sepsis:*
(α) *Primary*
(β) *Post operative*

(5) *Urinary back pressure:*

(a) *Urinary obstruction:*
(α) Gradual: prostatism
(β) Sudden. impacted stone
(b) *Sudden relief of obstruction:*
. With sudden decompression

(6) **Kidney destruction anuria:**

(a) Gradual hydro or pyo nephrosis
(b) *Removal of only functioning kidney*

Path. (1) Rise in blood urea:
: (Normal between 20 → 35 mgm. per 100 c.cs.)
(2) Acidosis
(3) Inefficient kidneys

Clinic: (1) *Urinary.*

(a) **Primary urinary focus**
(b) Oliguria, anuria or polyuria

(2) *Circulatory:*

(a) **High blood-pressure**
(b) Bradycardia
(c) Arterio sclerosis

(3) *Cerebral:*

(a) **Headache**
(b) Twitchings → convulsions

(c) **Drowsiness** → coma
(d) Retinitis → amaurosis
(e) Local paræsthesia or palsies
(f) Mania or delusional insanity

(4) *Respiratory*
(a) Dyspnœa
Paroxysmal and hissing
(b) **Hiccough**

(5) *Gastro intestinal*
(a) Nausea and **vomiting**
(b) **Thirst and dry tongue**
(c) Diarrhœa
(d) Dyspepsia and anorexia
(e) Tympanitis → **paralytic ileus**

Signs *Of kidney inefficiency* (See page 1584)
(1) Indigocarmine test
(2) Phenol sulphonphthalein test
(3) Urea concentration test
(4) Blood urea estimation
(5) Diastase test
(6) Intravenous pyelography

Treat (1) **Purgation:**
(a) Mag sulph drachm ½–1
(b) Pulv jalap co drachm 1–1½
(c) Mist sennæ co ounce 1

(2) **Diaphoretic:**
(a) Hot packs
(b) Pilocarpine 1/60 gr

(3) **Diuretics:**
(a) **Tap water:** Oral and rectal
(b) **Normal saline.** Rectal, subcut, venous
(c) **Glucose** Oral, rectal, venous
(d) **Isotonic sodium sulphate: venous**
42 85 gms of Glauber salt in 1 litre of water
(e) **Diuretic mixture:** Oral

℞	Pot acetas	grs	x
	Pot citras	grs	x
	Spt etheris nitrosi	m	xxx
	Inf buchu	ad ounce	i

(4) **Urinary drainage:** *Gradual decompression*
(a) Urethral catheter
(b) Ureteral catheter
(c) Suprapubic cystostomy
(d) Nephrostomy

(5) Peritoneal lavage
(6) *Renal decapsulation*

IMPORTANT POINTS

(1) *Acidosis should be suspected when vomiting, for which there is no apparent reason, continues for more than 48 hours after operation, with characteristic odour of new mown hay to the breath*

(2) Diagnosis in acidosis and alkalosis
- (a) H ion concentration of blood
- (b) Alkali reserve of blood
- (c) Alveolar Co.
- (d) Reaction of freshly passed urine
- (e) Aceto acetic acid in urine
- (f) Amount of soda bi carb to make urine alkaline
  Normal 5 gms

(3) *Shock is a clinical term applied to a condition of general depression of vital functions caused by ischæmia due to lowered blood pressure, brought about by capillary and venous stasis or hæmorrhage, and with a clinical syndrome of circulatory depression as shown by*
- (a) *Running pulse*
- (b) *Subnormal temperature*
- (c) *Mental apathy*

(4) *Blood pressure provides an index of the degree of shock*

(5) Shock is due to a deficiency in the volume of circulating blood, brought about by an enormous distension of capillary bed throughout the body, caused by histamine produced in the damaged tissues and entering the blood stream, or by actual loss of blood in hæmorrhage.

(6) *Surgical shock can be defined as a state of circulatory failure or depression consequent upon direct injury to body tissues*

(7) Loss of fluid hæmorrhage and noci ceptive centri petal impulses from the damaged area are important factors in traumatic shock

(8) *Vocal anæsthesia is of extreme importance in association with local or spinal anæsthesia*, a helpful and reassuring conversation on the part of the surgeon is of great value in reducing shock

(9) *For intravenous infusion*, compatible *blood* is the best fluid for use in most cases of shock, but *saline* and *sugar* solutions are also of value

(10) *Warmth + morphia + blood transfusion is a great anti shock triad*

(11) Treat a fall in blood pressure during the course of an operation, by covering the wound with hot clothes and waiting until a rising blood pressure indicates recovery, before proceeding further.

(12) Rise of temperature after brain injury is a grave prognostic sign

(13) *Few, if any, cases of obstructive jaundice with a hold on life, should be abandoned as hopeless without exploration*

(14) *Yellow sclerotics denote obstructive jaundice, the outstanding causes of which are, cholangitis, gall stones and carcinoma*

(15) Complications of impaction of a gall stone in the duct
- (*a*) White bile with hepatic failure
- (*b*) Acute suppurative infection
  - (α) Cholangitis Charcot s hepatic fever
  - (β) Hepatitis hepatic abscesses
  - (γ) Cholecystitis empyema, gangrene
- (*c*) Suppurative pylephlebitis
- (*d*) Perforation → local peritonitis
- (*e*) Internal fistulæ → intestinal obstruction
- (*f*) Cicatricial stenosis of the duct
- (*g*) Pancreatitis acute or chronic.

(16) *Cholecystography should not be done in the presence of jaundice*

(17) *If jaundice persists more than six weeks, it is more than catarrhal*

(18) The first thing to decide in jaundice is whether it is medical or surgical

(19) When jaundice is not deep, the question of early operation does not arise, operate within 24–48 hours if
- (*a*) Progressive
- (*b*) Painless
- (*c*) Olive hue

(20) Jaundice classification
- (A) Obstructive
  - (*a*) Lumen
  - (*b*) Wall
  - (*c*) Outside
- (B) Non obstructive
  - (*a*) Liver
  - (*b*) Blood
  - (*c*) *Infective*
  - (*d*) Poisons
  - (*e*) Nervous.

(21) Chief complications of jaundice
- (*a*) Hæmorrhage
- (*b*) Acidosis
- (*c*) Cholæmia
- (*d*) Intestinal or gastric ileus

(22) Cholæmia
- (1) Hepatic strain
- + (2) Fever + vomiting + anuria + nervous symptoms

(23) In obstructive jaundice operation
  (a) Primary object
    Relief of obstruction by proximal drainage
  ↓ (b) Secondary object
    Removal of the cause of obstruction

(24) *Do not be in a hurry to operate on jaundice, at the same time, do not leave it too long either*

(25) *In jaundice, chief point in the operation is the drainage of bile through proximal drain*, if drainage is not copious or even present, it means proximal obstruction, liver failure or reflex traumatic inhibition

(26) White bile
  (a) Hepatic failure
  or (b) Isolated gall bladder

(27) *Bugbears in jaundice*
  (a) *Hæmorrhage*
  (b) *Acidosis*
  (c) *Cholangitis*
  (d) *Liver death primary and renal*
  (e) *Ileus gastric or intestinal*

(28) Different jaundice syndrome
  (a) Stone jaundice fluctuating intensity
  (b) Carcinoma jaundice relentlessly progressive

(29) Acholuric jaundice
  (a) Jaundice
  (b) Cholecystitis
  (c) Enlarged spleen
  (d) Young slim patient

(30) *Hæmorrhage, renal inefficiency and infection of the ducts are the most common causes of death following operations upon the gall bladder and biliary passages*

(31) *Calcium, glucose + insulin and avoidance of chloroform are sheet anchors in jaundiced people*

(32) The bleeding tendency manifests itself 3 or 4 days after operations for jaundice.

(33) *Bleeding tendency in jaundice is due essentially to a deficiency of prothrombin*

(34) *For deficient coagulation time*
  (A) *Intravenous*
    (1) *Calcium gluconate 10%, 10 c.cs*
    (2) Calcium chloride 10%, 10 c.cs
    (3) Blood transfusion
  (B) *Intramuscular*
    (1) Calcium gluconate 10%, 10 c.cs.
    (2) Sodium citrate. 30%, 30 c.cs

(58) *It is better to divide the insulin into frequent small doses (15 units) when large doses are to be given*

(59) A diabetic coma or acidosis may present clinical syndrome which may simulate appendicitis, cholecystitis or peptic perforation

(60) The amount of insulin necessary to keep a post operative diabetic sugar free and ketone free may vary from 0 to 100 units every few hours

(61) *Amputation in diabetic gangrene*

(a) *Amputate through clearly healthy tissues*
(b) *Employ equal flaps*
(c) *Leave the wound open*
(d) *Prophylactic anti gas gangrene*
(e) *Use spinal or evipan anaesthesia*

(62) Acute abdomen should not be postponed even in the presence of acidosis or coma

(63) *Ratio of glucose to insulin should be 2 gms to 1 unit*

(64) *An abundant carbohydrate allowance in the ante operative diet* prepares the diabetic for the drain on the glycogen reserve during the post operative period and also brings about complete combustion of fats and *prevents ketosis*

(65) Whatever kind of diet selected, if glycosuria persists, it should be abolished by giving insulin

(66) *Before giving insulin to a diabetic, urine analysis should be made without fail, every time*

(67) *Intravenous administration of glucose 250 c cs of 10% sol with 20 to 25 units of insulin, is a valuable pre-operative measure in diabetes*

(68) *Starvation diets must have no place in the pre operative treatment of surgical diabetics, but a diet rich in carbo hydrates and low in fats and proteins should be allowed*

(69) *Adrenaline and pituitrin neutralize insulin*

(70) Hypoglycaemia = shock + nervous symptoms.

(71) *1 Pint of milk = 28 gms of glucose = 14 units of insulin*

(72) Beyond the age of 50, people with diabetes have pathological changes in heart, blood vessels and kidneys

(73) Clinical acidosis will not develop if sufficient glucose is oxidised, *insulin is not a sufficient protection unless glucose be administered with it*

(74) *Before an emergency operation in diabetes, to counteract marked glycosuria and acidosis, the best and quickest method is to give an intravenous injection of 20 c.cs of 50% glucose and about 20 to 30 units of insulin, repeat if acidosis develops after operation*

(75) *It is useless to attempt to reduce patient's glycosuria in the presence of undrained infection*

(76) *When gangrene involves foot or lower leg, amputate well above the knee, to amputate directly above the gangrenous area is a mistake in diabetes*

(77) Complications of insulin therapy

(a) Insulin allergy

Treat Histamine phosphate 3 times a week

0 1 mgm → 1 mgm upto 12 mgm

(b) Insulin resistance

(c) Hypoglycæmia

(78) Emotional states must be avoided at meal times by all diabetics

(79) Elevated blood sugar impairs patient s power of resistance.

(80) Infection tends to elevate the blood sugar content and to precipitate coma

(81) Infection plays an important part in upsetting the sugar tolerance of an otherwise controlled case of diabetes

(82) *Never treat too lightly even a trivial infection in diabetics*

(83) Diabetics past the age of 40 complaining of even vague and indefinite digestive symptoms should have the gall bladder thoroughly investigated

(84) Diaphoretics are useless and even harmful in uræmia, what the patient requires is a diuretic

(85) *Never starve a diabetic for a long time before operation*

(86) *Emergency operation on a diabetic with acidosis or coma*

(A) (a) *50 units of insulin subcutaneous*

(b) *50 c cs of 50% glucose + 50 units insulin Intravenous*

Repeat every hour till urine is ketone free

(B) *Oral, rectal, subcutaneous fluids 3000 c.cs in 24 hours*

If there is no actual coma

20 c.cs of 50% glucose + 20 units insulin Intravenous

(87) *Drainage and excision of infected tissues are of primary importance, without which it is useless to reduce glycosuria in diabetes in surgery*

(88) *Diabetic coma sometimes comes on with dramatic suddenness*, not a single day should pass without a conscientious examination of the urine for sugar and ketone bodies, in diabetics with infection or surgical intervention.

(89) *Infected corn or shoe-bite in an elderly patient : examine the urine for sugar.*

(90) A diabetic must be under strict dietary surveillance during the whole course of any surgical treatment from the beginning to the end; and no indiscretion should be allowed especially in acute phase

CHAPTER IX

GANGRENE

Def: Death of the tissues en masse:
- (a) Necrosis death of bone or cartilage
- (b) Sloughing death of soft tissues
- (c) Gangrene: death of a part of body

Types: (1) **Dry gangrene:**
- Etio: (a) Arrest of blood supply
- + (b) Efficient venous circulation
- + (c) Evaporation
- + (d) Relative asepsis

(2) **Moist gangrene:**
- Etio. (a) Arrest of blood supply
- + (b) Obstruction to veins
- + (c) Moisture
- + (d) Relative sepsis

Path: (1) **Dry gangrene:**
- (a) Endarteritis, embolus or ligature
- ↓ (b) Dry death

(2) **Moist gangrene:**
- (A) *Aseptic moist gangrene:*
  - (a) Stasis of circulation
  - ↓ (b) Thrombosis and hæmolysis
  - ↓ (c) Signs of death
- (B) *Septic moist gangrene.*
  - (a) Moist gangrene
  - + (b) Bacterial putrefaction:
    - (α) Nitrogenous products
    - (β) Non nitrogenous products

(3) **Line of separation:**
: Dead part, acting as an irritant, sets up in the proximal living tissues.
- (a) Inflammation
- ↓ (b) Ulceration
- ↓ (c) Line of demarcation

Clinic: (1) Change of colour
- (2) Loss of sensations: touch and pain
- (3) Loss of heat
- (4) Loss of pulsation
- (5) Loss of function
- (6) Sapræmia

(1) *Local:*
- (A) **Dry gangrene:**
  - (a) Paræsthesia → acute pain
  - (b) Skin:

(α) Waxy → greasy → transparent
↓(β) Yellow → brown → black
↓(γ) Shrivelled hard dry
(c) Line of separation
(α) Ill defined
(β) Slow
(γ) Unstable
(d) Living tissues
Inflammation not marked

(B) Aseptic moist gangrene
(a) Acute pain
(b) Skin
(α) Cold insensitive
(β) Blebs bullæ œdema
(γ) Mottling + dusky lines
(δ) Play of colours
(c) Line of separation
Rapid
(d) Living tissues
Inflammation not marked

(C) Septic moist gangrene
(a) Skin
(α) Waxy mottled multi coloured
(β) Slippery derm s with bullæ
(γ) Crepitations
(δ) Foul odour
(b) Line of separation
(α) Rapid
(β) Well marked
(c) Living tissues
Inflammation well marked

(2) *Constitutional* Sapræmia and exhaustion
(A) Dry gangrene
Sapræmia not marked
Chronic exhaustion due to pain
(B) Aseptic moist gangrene
Sapræmia moderate
(C) Septic moist gangrene
Sapræmia most marked

(3) *Indirect evidence*
(A) Examination of heart
Endocarditis
(B) Examination of peripheral vessels
Arterio sclerosis atheroma Buerger
(C) Peripheral or central nervous system
(D) Metabolic diseases
(a) Nephritis
(β) Diabetes

Treat· (1) **Promotion of asepsis:**
. Dressings
(2) **Promotion of dryness:**
(a) Relief of constriction
(b) Elevation
(c) Gentle massage
(d) Promotion of evaporation
(e) Timely incisions
(3) **Protection and rest:**
(a) *Immobilisation in elevation*
(b) *Copious and extensive dressings*
(4) **Mechanical treatment:**
(A) Expectant or conservative
Allow the natural separation
(B) Amputation

Classific. (1) CIRCULATORY GANGRENE
(A) *Circulatory incompetency gangrene* ·
Etio (a) Exhausting diseases
(b) Toxæmias
Path (a) Incompetent heart
+ (b) *Arterio sclerosis*
+ (c) Slow circulation
↓ (d) Malnutrition of peripheral parts
Sites (a) Distal parts of limbs
(b) Ears + tip of nose
Clinic (a) Dry
or (b) Moist if thrombosis
(c) Symmetrical
Treat (1) Conservative
(2) Cardiac stimulants

(B) *Embolic gangrene* · (See pages 143 to 153)
Etio (a) Endocarditis
(b) Arterio sclerosis
Path (1) Sudden cutting off of the blood supply
↓ (2) Ischæmia
Clinic (a) **Intense local pain:**
In the course of an artery
↓ (b) **Distal ischæmia:**
(α) Loss of pulse
(β) Loss of heat
(γ) Change of colour
↓ (c) **Gangrene:**
(α) Dry
or (β) Moist: aseptic or septic
Treat: (1) **Embolectomy:**
Ind (a) Young age
(b) Lower limb

1972

(c) Large artery
(d) Absence of capillary sclerosis
(e) *Within 6 hours of onset*

(2) **Expectant :**
Ind Upto 48 hours
Treat Vasodilators : Eupavarine, etc.

(3) **Amputation :**
Ind Established gangrene
Site. *Above the embolus*

(C) *Thrombotic gangrene*

Types (1) **Arterial :**
Etio (a) Endarteritis
(b) Atheroma
(c) Acute arteritis
(d) Embolism
(e) Trauma
(f) Infective and wasting diseases
Clinic Dry gangrene
Treat As in embolic gangrene

(2) **Venous :**
Etio (a) General debility
(b) Toxæmia
(c) Sluggish circulation
(d) Pressure tourniquet
(e) Infiltration malignancy
(f) Local sepsis puerperal sepsis
Predisp (a) Typhoid
(b) Plaster immobilisation
(c) Malignant infiltration
Clinic Moist gangrene
Treat Amputation
Above the level of lesion

(D) *Ligation gangrene*

Predisp (a) Exhausting diseases
(b) Peripheral arterio sclerosis
(c) Aneurysm (thrombosis + pressure)
Cause (1) Ligature of main artery alone
(2) Hunterian operation
- Proximal ligature at a distance
Treat (1) Prophylactic
Tie the companion vein
(2) Curative
Expectant → amputation
As low down as possible

(E) *Vascular traumatic gangrene.*

Syn : Indirect traumatic gangrene

Path: (a) Contusion → thrombosis
(b) Hæmatoma → pressure
(c) Rupture or division
(d) Laceration

Clinic: (1) Damaged artery alone:
: Dry gangrene
↓ (2) Damaged vein alone:
: Aseptic moist gangrene
(3) Damaged artery + vein:
: Septic moist gangrene

Treat: (1) Expectant treatment:
: For 24 hours
↓ (2) Amputation
Ind: (a) No recovery within 24 hours
(b) Gangrene already started
(c) Injury to associated structures
(d) Old people
Site. (a) Above the seat of injury
or (b) Collateral circulation level

(F) *Pressure gangrene:*

Etio. (a) Sudden and acute:
. *Tourniquet, bandage, plasters*
. Hæmatoma, dislocation
(b) Progressive.
: Tumour, aneurysm

Clinic: (a) Dry
or (b) Moist

Treat: (a) Removal of cause
↓ (b) Expectancy
↓ (c) Amputation

(G) *Senile gangrene:*

Predisp. (a) Hyperpiesia
(b) Chronic toxæmia:
(α) Infective
(β) Metabolic
(c) Syphilis

Etio: (a) **Arterio-sclerosis**
(b) Calcareous degeneration
(c) Annular calcification
+ (d) Trivial trauma or infection

Clinic: (a) Men after 40
(b) **Intermittent claudication**
(c) Rigid tortuous arteries:
: Little or no pulsation
(d) **Dry gangrene:**
: Slowly progressive

Compl : (*a*) Exhaustion
(*b*) Septic infection

Treat (1) **Prophylaxis** ·
(*a*) Gentle exercise and massage
(*b*) Warm baths
(*c*) Protection cotton wool dressings

(2) **Threatening gangrene :**
(*a*) Arterio venous anastomosis
(*b*) **Peri arterial sympathectomy**
or (*b*) Peri arterial alcohol
4 minims
+ (*c*) **Companion vein ligature**

(3) **Established gangrene :**
(*a*) Stationary
Expectant
(*b*) Progressive
Amputation

(H) *Pre senile gangrene · Buerger*
(See pages 152 and 862)

Treat (1) **Amputation :**
Ind Extensive gangrene
With or without rest pain
(2) **Lumbar ganglionectomy :**
Ind Trophic changes + Rest pain
(3) ***Medical measures :***
Ind No trophic changes or pain

(I) *Vaso spastic gangrene*

(A) **Raynaud's syndrome :**
(See pages 153 and 861)

(B) **Ergot gangrene :**

Etio Rye bread fungus claviceps purpurea

Path (*a*) Peripheral arteriolar spasm
↓ (*b*) Endarteritis
↓ (*c*) Thrombosis
↓ (*d*) Dry gangrene

Clinic (*a*) Nervous disturbances
(*b*) Digestive disturbances
(*c*) Extremities bilateral·
(α) Cramps + coldness
↓ (β) Chronic dry gangrene

Treat . (1) Remove the cause
(2) Coffee
(3) *Expectant treatment*

(2) NERVOUS GANGRENE

Etio: (1) *Nerve paralysis:*

Causes: (A) **Hemiplegia**
(B) **Paraplegia**
(C) **Monoplegia**

Path: (*a*) Modification of nutrition:
: Trophic changes
(*b*) Altered defensive strength:
: Against bacteria

(2) *Central nervous diseases:*

Causes: (*a*) **Tabes dorsalis**
(*b*) **Syringomyelia**

(3) *Peripheral neuritis:*

Causes: (*a*) **Diabetes**
(*b*) **Leprosy**
(*c*) **Cervical rib**

(4) *Sympathetic syndrome:*
: **Raynaud's disease**

Clinic: (1) **Underlying disturbances:**
(*a*) Diabetes
(*b*) Syphilis
(*c*) Leprosy
(*d*) Trauma

(2) **Nervous disturbances:**
(*a*) Sensory: Anæsthesia, paræsthesia
(*b*) Motor: paralysis
(*c*) *Trophic*

(3) **Local:**
(A) Perforating ulcer: (See page 34)
(B) Pressure sore: (See page 31)
(C) Moist spreading gangrene

(3) TRAUMATIC GANGRENE:

(A) *Direct traumatic gangrene:*

Def: Gangrene at the site of trauma

Etio: Run overs

Clinic: (*a*) Aseptic moist gangrene
or (*b*) Septic moist gangrene
or (*c*) Gas gangrene

Treat: (1) **Conservative:**

Ind: (*a*) Young patient
(*b*) No severe injury

Tech: (*a*) Debridement
(*b*) Re-establish the blood flow
(*c*) Carrel-Dakin

(2) **Amputation:**
Ind (a) Old and debilitated
(b) Severe injury.
(α) Main artery
+ (β) Main nerves
+ (γ) Muscles
(c) Anærobic sepsis
(d) General intoxication

B) *Indirect traumatic gangrene*
. (See under Circulatory Gangrene)
Def. Gangrene of the distal part due to trauma to the main artery of a limb

(4) PHYSICAL & CHEMICAL GANGRENE:

(A) *Heat*
. Burns (See page 7)

(B) *Cold*
Path (a) **Cold**
↓ (b) Peripheral vaso constriction
+ (c) Slow circulation
↓ (d) Ischæmia
+ (a) **Sudden application of warmth**
↓ (b) Excessive vaso dilatation
↓ (c) Stasis
↓ (d) Thrombosis
= Gangrene

Sites. Fingers, toes, ears, nose
Clinic (a) Pernio or chilblain
Sites Toes and fingers
Clinic (α) Burning and itching
(β) Œdematous, dusky red skin
↓ (b) Cracks and fissures
↓ (c) Blisters
↓ (d) Acute spreading ulcer
↓ (e) Dry slow gangrene
Treat (1) Gradual thawing
(2) Conservative

(C) *Escharotics.*
(1) **Acids:**
Etio Carbolic acid
· 1% sol for 24 hours
Path Coagulation of tissues
Clinic: (a) Paræsthesia → anæsthesia
↓ (b) Blanching + crenation
↓ (c) Dry gangrene
Treat: (a) Expectant
↓ (b) Amputation

(2) **Alkalies:**
Path. Liquefaction of tissues
Clinic: Moist gangrene.
(3) **Bite irritants:**
Etio: (*a*) Scorpion *bite*
(*b*) Serpent bite
Clinic: Progressive dry or moist gangrene

(5) DIABETIC GANGRENE:
: (See under Diabetes)

(6) INFECTIVE GANGRENE:
(1) *Acute inflammatory:*
Etio: Inflammation under tension
Path: Cutting off of the vascular supply
Clinic: (*a*) Boils
(*b*) Carbuncle
(*c*) Acute osteomyelitis

(2) *Gas gangrene:*
Def · Gangrene associated with gas production due to infection by anærobic bacteria
Etio: (A) **Trauma:** Nature of wound
(α) Lacerated
(β) Punctured
(Γ) Retained foreign body
(B) **Contamination with soil:**
: Manured or street
(C) **Host:**
(*a*) Interference with circulation:
(α) Occlusion of main artery
or (β) Pressure
(*b*) Retention of extravasated blood
(*c*) Low blood pressure
(*d*) Low vitality
Bact: Anærobic saprophytes in the intestines of man and animals:
(A) Proteolytic + Saccharolytic:
(*a*) Proteolytic +:
(1) **B. Sporogenes**
(2) B. Parasporogenes
(3) B. Centrosporogenes
(4) B Bifermentans
(5) B Aerofetidus
(6) B. Histolyticus
(*b*) Saccharolytic +:
(1) **B. Welchii**
(2) **Vibrion septique**
(3) B Chauvæi
(4) **B. Novyi**

(B) Proteolytic only :
: **B. Tetani**
(C) Saccharolytic only :
(1) B Fallax
(2) B Multifermentans
(3) B. Tertius
(4) B Tetanomorphus
(5) B Sphenoides
(D) No lysis
. B. Cochlearius

Biochem : (1) B Welchii
↓ (2) Carbohydrate fermentation
↓ (3) Gas + acids
↓ (4) Acidic inhibition of B. Welchii
+ (5) B Sporogenes
↓ (6) Protein destruction
↓ (7) Fœtid gas + ammonia bodies
= (8) Neutralisation of acids
↓ (9) Virulent B Welchii
↓ (10) Toxæmic adrenal paralysis

Path : (a) **Dissemination** along
(α) Direct **muscle** infiltration
(β) Loose connective tissues
(γ) Lymphatics
(δ) Blood stream
(b) **General toxæmia :**
Asthenic and toxic shock

Morb anat (1) **Gas formation**
(2) **Tissue necrosis :**
(a) Muscles
(α) Red death
↓ (β) Yellow death
↓ (γ) Black death
(b) Blood vessels .
Thrombosis
(c) Hæmolysis
(3) *Entire absence of inflammation*

Clinical synd : (1) **Localised :** Local wound
(2) **Group :** Muscle group
(3) **Massive :** Whole limb
(4) **Fulminating :** Extending

Clinic : (1) *Dramatically sudden onset*
(2) Local signs
(a) Change in colour
(b) Blebs and bullæ
(c) Non inflammatory œdema
(d) *Crackling gas*

(e) Fœtid discharge
(f) Extensive sloughs

(3) General signs:
(a) Toxic shock
(b) Hæmolysis

Treat: (A) **Preventive:**
(a) Avoid pressure
(b) Avoid dry dressings
(c) Avoid tight plugging
(d) Avoid arterial injury
(e) Avoid shock and hæmorrhage
(f) **Prophylactic anti-serum**
(g) **Oxygenation of wound: H_2O_2**

(B) **Curative:**
(1) *Anti serum*
(2) Excision of wound
or (2) Multiple incisions:
: With H_2O_2 irrigations
or (2) **Guillotine amputation:**
Ind: Fulminating
Site: Well above the lesion
+ (3) *Anti serum*
+ (4) Blood transfusion
(5) Intravenous soda-bi-carb

(3) *Cancrum oris*:
Def: Infective gangrene of mouth and face
Etio: (a) Children
(b) Debility, exhaustion, toxæmia
(c) Inattention to oral hygiene

Bact: Streptococcus

Path. Extending diffuse gangrene

Clinic: (1) General toxæmia or exhaustion
(2) Local. inside the oral cavity
(a) Greyish patch
↓ (b) Slough. black
↓ (c) Gangrene
↓ (d) Perforation cheek

Compl: (1) Septic intoxication
(2) Broncho-pneumonia
(3) General asthenia
(4) Deformity

Treat. (1) Excision
+ (2) Cauterisation
By: (a) Cautery
(b) Carbolic or nitric acid
+ (3) Treatment of general condition

(B) Proteolytic only :
: B. Tetani

(C) Saccharolytic only :
(1) B Fallax
(2) B. Multifermentans
(3) B. Tertius
(4) B. Tetanomorphus
(5) B Sphenoides

(D) No lysis :
: B. Cochlearius

Biochem : (1) B. Welchii
↓ (2) Carbohydrate fermentation
↓ (3) Gas + acids
↓ (4) Acidic inhibition of B. Welchii
+ (5) B. Sporogenes
↓ (6) Protein destruction
↓ (7) Fœtid gas + ammonia bodies
= (8) Neutralisation of acids
↓ (9) Virulent B. Welchii
↓ (10) Toxæmic adrenal paralysis

Path : (*a*) **Dissemination** along :
(α) **Direct muscle infiltration**
(β) Loose connective tissues
(γ) Lymphatics
(δ) Blood stream

(*b*) **General toxæmia :**
Asthenic and toxic shock

Morb anat : (1) **Gas formation**
(2) **Tissue necrosis :**
(*a*) Muscles :
(α) Red death
↓ (β) Yellow death
↓ (γ) Black death
(*b*) Blood vessels :
: Thrombosis
(*c*) Hæmolysis
(3) *Entire absence of inflammation*

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(f) Extensive sloughs

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(c) *Avoid tight plugging*
(d) Avoid arterial injury
(e) Avoid shock and hæmorrhage
(f) **Prophylactic anti-serum**
(g) **Oxygenation of wound: H_2O_2**

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or (2) Multiple incisions:
: With H_2O_2 *irrigations*
or (2) **Guillotine amputation:**
Ind: Fulminating
Site: Well above the lesion
\+ (3) *Anti-serum*
\+ (4) Blood transfusion
(5) Intravenous soda-bi-carb

(3) *Cancrum oris* ·
Def: Infective gangrene of mouth and face
Etio: (a) Children
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Bact: Streptococcus
Path. Extending diffuse gangrene
Clinic: (1) General toxæmia or exhaustion
(2) Local: inside the oral cavity
(a) *Greyish patch*
↓ (b) Slough. black
↓ (c) Gangrene
↓ (d) Perforation cheek
Compl: (1) Septic intoxication
(2) Broncho pneumonia
(3) General asthenia
(4) Deformity
Treat. (1) Excision
\+ (2) Cauterisation.
By. (a) Cautery
(b) Carbolic or nitric acid
\+ (3) Treatment of general condition

CHAPTER XI

DIPHTHERIA

Def Infection by B Diphtheria, causing extending *false membrane and toxæmia*

Etio (1) Susceptibility
(2) **Contact:**
Types (*a*) Direct
(α) Kissing
(β) *Droplet infection*
(*b*) Indirect
Infected material
With (*a*) Diseased person
(*b*) Carriers
(3) **Age: 3 to 10 years**
(4) Overcrowding and bad sanitation

Bact Klebs Loffler's B diphtheria

Path (A) **False membrane** on the muc. mem
(1) *Pharynx* Faucial diphtheria
(2) *Larynx* Laryngeal diphtheria
(3) Nares . Nasal diphtheria
(4) *Trachea and bronchi*
(5) Lungs
(6) Conjunctivæ
(7) Genitals
(8) Local wounds
(9) Ext aud meatus otitis media
(B) General toxæmia

Morb anat (1) Epithelial cells
(*a*) Inflammation
↓ (*b*) Necrosis
(2) False membrane ·
Color Dirty white brown, greyish brown
Formation (*a*) Fibrin
(*b*) Detritus
(α) Leucocytes
(β) R. B Cs.
(γ) Epithelial cells
Characters **Adherent to deeper tissues**
Sequelæ (*a*) Healing under the membrane
(*b*) Shedding of the membrane

Clinic. (A) *Local* Incubation one to four days
(1) **Faucial.**
(*a*) *Sore throat*

(b) *False membrane* :

Characters (α) *Adherent*
(β) Scattered
(γ) Tenacious
(δ) Surrounded by redness

Sites (α) Tonsils
(β) Soft palate → uvula
(γ) Post.-pharyngeal wall

(c) Dyspnœa and dysphagia

(2) **Laryngeal :**
(a) *Hoarseness* → aphonia
(b) *Dyspnœa* and cyanosis
(c) Crowing respiration and air hunger
(d) Restlessness

(3) Nasal
: Nasal discharge

(4) Conjunctival

(5) Otitic

(6) Genital :
: Vulva, vagina, prepuce

(7) Local :
: Wounds

(8) Septic

(9) Hæmorrhagic

(B) *Systemic*. Toxæmia
(a) Fever with malaise
(b) Albuminuria
(c) Circulatory depression
(d) Peripheral neuritis

Compl (1) Acute circulatory failure :
(A) Primary : toxic
(B) Secondary : to
(a) Respiratory
(b) Cardiac

(2) Acute cardiac failure :
(A) Primary : toxic (myocarditis)
(B) Secondary to respiration

(3) Albuminuria

(4) Pulmonary complications

(5) **Paralysis :**

Etio : Diphtheria toxin

Path : Peripheral neuritis

Sites : (a) **Soft palate :**
(α) *Nasal regurgitation*
(β) *Nasal voice*

(b) **Cardiac muscle :**
: Acute heart failure

(c) Diaphragm

(d) Any other muscle

(6) Otitis media

Diag (1) History of exposure
(2) Sore throat
(3) False membrane
(4) Microscopical examination
(5) Schick skin reaction

Diff diag (a) Vincent's angina
(b) Acute tonsillitis
(c) Peritonsillar abscess
(d) Retropharyngeal abscess
(e) Syphilis
(f) Laryngitis
(g) Scarlet fever

Prognosis *Depends on early diagnosis & early treatment*

Bad in (a) Early age
(b) Late treatment
(c) Extension of membrane:
(α) One tonsil mild
(β) Two tonsils serious
(γ) Tonsil + fauces grave
(δ) Larynx ? hopeless
(d) General toxæmia
(e) Heart condition

Treat (1) *Prophylactic swab in every tonsillitis*
(a) 500 units of antiserum
(b) Antiseptic gargles
(c) Hand washes
(d) Isolation:
(α) For one month after apparent cure
(β) Upto negative swabs
(e) Disinfection of contact things

(2) *Hygienic*
(a) Free ventilation
(b) Sponge baths

(3) *Dietetic:*
Liquid or semisolid food

(4) *Constitutional:*
(a) Rest in recumbency
(b) Treat
(α) Heart and circulation
(β) Kidneys
(γ) Bowels

(5) *Anti serum.*
(A) Antidiphtheritic:
Routes (a) Intramuscular
(b) Intravenous

Dose: (a). Within few hours:
: 3,000 units
(b) 6–12 hours:
. 5,000 units
(c) Localisation to tonsils
· *5,000 units*
(d) Soft palate, uvula:
· 10,000 units
(e) Nasal fossa and larynx:
20,000–30,000 units
(f) Septic and hæmorrhagic cases:
· 40,000–50,000 units

Compl · (a) Serum sickness
(b) Anaphylaxis

(B) **Antistreptococcal:**
Ind. High temperature

(6) *Local:*
(a) Oral treatment ·
(α) Alkaline washes
(β) Alkaline irrigations
(γ) Alkaline gargles
(b) *1% argyrol gargles & applications*

(7) *Operative:*
(A) **Intubation of larynx:**
Ind: (a) *Rapid pulse*
(b) Laboured breathing
(c) Dyspnœa & cyanosis
(d) Restlessness
Position: (1) O'Dwyer's upright position
(2) Dorsal method
Duration (a) One week
(b) Free breathing for 2 days

(B) **Tracheotomy:**
Ind. (a) Difficult intubation
(b) Extension into trachea
+ (c) Lower trachea free

CHAPTER XII

SYPHILIS

Course: (A) **Incubation:** 9 → 90 days
↓ (B) **Primary Chancre**
↓ (C) Local → general **lymphadenopathy**
↓ (D) **Wassermann:** After 30 days
↓ (E) **Secondary stage:** After 30 to 45 days
- (*a*) **Rash:**
  - (1) Erythematous
  - (2) Papular
  - (3) Papulo squamous
  - (4) Squamous
  - (5) Papulo pustular
  - (6) Pustular
  - (7) Ecthymatous
  - (8) Mucous patches
- (*b*) **Secondary anæmia**
- (*c*) Malaise + Pyrexia

↓ (F) **Period of quiescence:** 1 → 4 years
↓ (G) **Tertiary stage:**
- (*a*) **Gummata**
- (*b*) Neuro syphilis
- (*c*) Circulatory syphilis
- (*d*) Liver, kidneys

Bact: Treponema pallidum

Path: (*a*) Infection by treponema
(*b*) Spread along lymph channels:
- (α) Subcutaneous
- (β) Perivascular
- (γ) Perineural

Morb anat: (*a*) Proliferation of
- (1) Connective tissue cells
- (2) Endothelial cells
- (3) Lymphocytosis
- (4) **Plasma cells**
- (5) **Fibroblasts**
- (6) Giant cells

(*b*) **Endarteritis obliterans**

Sequelæ: (A) Primary stage
- (*a*) Resolution
- *or* (*b*) Fibrosis

(B) Tertiary stage
- (*a*) Fibrosis
- *or* (*b*) Ulceration

Diagnosis (1) **Microscopical exam** · Earlier secretions
Dark ground method
(2)
(3)
(4)
(*a*) Lymphocytosis
(*b*) Albumin and globulin +
(*c*) Wassermann +
(*d*) Lange's gold test

Clinic (1) *Primary lesion Chancre*
Characters (*a*) Treponema in secretion
(*b*) Rose pink band
(*c*) Stiff and rubbery
(*d*) Painless enlargement of glands
(*e*) Induration
(*f*) Long incubation period

Sites (A) **Genital chancre :**
Clinic (*a*) *Indurated papule*
↓ (*b*) Painless regional adenopathy
Sites (*a*) Male genitals
(1) Preputial rim
(2) Preputial mucous mem
(3) Glans penis
(4) Ext. urinary meatus
(5) Skin of the penis
(6) Skin of the scrotum
(*b*) Female genitals
(1) Labia
(2) Cervical orifice
Compl (*a*) Syphilitic indurative œdema
(α) Penile skin
(β) Preputial margin
(γ) Labial skin
(*b*) Phimosis
(*c*) Septic balanitis
(*d*) Phagedæna
(*e*) Inguinal adenitis
Diag Microscopical exam of scrapings
from (*a*) Margins of the chancre
(*b*) Enlarged lymph gland
Diff diag (*a*) Balanitis
(*b*) Herpes genitalis
(*c*) Scabies penis
(*d*) Secondary lesions
(*e*) *Soft chancre*
(α) Incubation less
(β) *Painful*

(γ) *Multiple*
(δ) Scar formation
(ε) *Inguinal adenitis*

(B) **Extragenital chancres**

Clinic (*a*) *Indolent indurated sore*
(*b*) Indolent massive regional adenitis

Sites (*a*) Anus and rectum
(α) Indurated fissure or ulcer
(β) Abnormal discharge
(*b*) *Fingers*
Superficial erosion or papule
Whitlow
(*c*) *Lips*
Indurated erosion or ulceration
(*d*) Tongue
Raised sore
(*e*) Tonsils
Enlarged and indurated
(*f*) Eyelids
Pink papule at inner canthus
(*g*) Conjunctiva
Papule
(*h*) Eustachian tube
(*i*) *Breast*
Indurated indolent fissure

(C) **Adenitis**

Site Regional → general
Clinic *Smooth discrete oval, indurated*

(2) *Secondary lesions*
(1) **Erythema of the soft palate**
(2) **Skin eruptions**

Types (*a*) **Roseolar or macular**
(*b*) **Papular**
(α) Lenticular
(β) Follicular
(*c*) Papulo squamous
(*d*) **Squamous**
(*e*) Papulo pustular
(*f*) **Pustular**
(*g*) **Follicular**
(α) Small
(β) Large
(*h*) **Ecthymatous**
(*i*) **Condylomas**

Sites (*a*) Palms and soles
(*b*) Forehead Corona veneris
(*c*) Face
(*d*) Penis

(*e*) Scrotum
(*f*) Moist surfaces

Diag. (*a*) *Pleomorphism*
(*b*) *Absence of irritation*
(*c*) Collarette of loose epith.
(*d*) *Copper colour*
(*e*) Characteristic grouping
(*f*) Circular or oval shape
(*g*) *Treponema in secretions*

(3) **Mucous membranes:** Mucous patches

Sites (*a*) Faucial pillars
(*b*) Lips
(*c*) Tonsils
(*d*) Tongue
(*e*) Angle of the mouth

Clinic (*a*) Ulcer
(*b*) Fissure
(*c*) Papule

(4) **Laryngitis:**
Chronic laryngitis with little discomfort

(5) **Hair:** Alopecia

(6) **Nails:** Onychia and paronychia

(7) **Bones:**
(*a*) Osteocopic pains
(*b*) Periosteal nodes

(8) **Synovial membranes:**
Clinic Quiet effusion
Sites Knees and elbows

(9) **Eyes:**
(*a*) Iritis and irido cyclitis
(*b*) Choroiditis and retinitis
(*c*) Interstitial keratitis
(*d*) Neuro-keratitis

(10) **Ears:**
(*a*) Deafness
(*b*) Otitis media

(11) **Testicle**

(12) **Veins:** Thrombo phlebitis

(13) **Visceral lesions:**
(*a*) Nephritis
(*b*) Acute yellow atrophy of liver
(*c*) Gastro intestinal syphilis
(*d*) Lung infiltration

(14) **Nervous lesions:**
(*a*) Meningitis
(*b*) Meningo myelitis
(*c*) Myelitis
(*d*) Meningo-encephalitis

(15) Anæn

(3) *Tertiary lesions:*
: **Gumma:**
Clinic: (a) History of trauma
(b) *Induration*
(c) *Circular shape*
(d) Abscess formation
(e) *Gummy discharge*
(f) *Punched out ulcer*
Sequelæ (a) Resolution
(b) Fibrosis
(c) Osteosis
Sites: (1) **Skin:** Nodular cutaneous syphilide
. Scaly deep red nodules
↓ Punched-out shallow ulcers
↓ *Soft tissue paper* scars
(2) **Subcutaneous:**
(a) Rubber-like nodules
↓ (b) *Punched out ulcers*
(3) **Muscles:**
(a) Gummatous infiltration
(b) Local gumma
(4) **Bones:**
(a) Local gummatous osteo periostitis:
Sites. Clavicle, sternum, ribs
· Tibia, cranium
Clinic: (α) Smooth ivory-like boss
(β) Funnel like ulcer
(b) Diffuse osteo-periostitis:
Clinic. Chronic, tender, thickening
(A) Facial and nasal bones:
(a) Ozæna
(b) *Saddle nose*
(c) *Perforated palate*
(B) Orbit
(C) *Dactylitis:*
Def.: Gummatous osteitis of phalanx
Clinic: (a) Painless thickening
or (b) Painless absorption
or (c) Discharging sinus
Diff. diag. (a) T. B dactylitis
(b) Enchondromata
(5) **Synovial membranes:**
(a) Diffuse gummatous infiltration
(b) Gummatous nodules
(6) **Testicle:**
(a) Interstitial gummatous orchitis:
: Large, smooth, elastic, heavy
(b) Gumma:

Clinic (α) *Painlessly enlarged body*
↓ (β) Gummatous *anterior ulcer*
or (γ) Atrophy testis
or (δ) Hernia testis
Diff diag (α) T. B testis
(β) Malignant testis

(7) **Penis:** Gumma of the body

(8) **Mucous membranes:**

(*a*) Lip
(α) *Infiltration*
(β) Nodule
(γ) Ulcer

(*b*) Cheek
Leucoplakia of angle of mouth

(*c*) ∴ *Tongue Local gumma*
(α) Superficial glossitis
(β) Leucoplakia
(γ) Gumma

(*d*) *Palate Perforation*
(α) Gumma → perforation
(β) Nodular infiltrations
(γ) Ulcers
(δ) Dense white scars

(*e*) Tonsils
Painful elastic swelling

(*f*) Posterior pharyngeal wall

(9) **Ears**

(10) **Larynx:**
(*a*) Tertiary infiltration
↓ (*b*) Ulceration
↓ (*c*) Deformity

(11) **Arteries:** *Aneurysm*

(12) **Gastro-intestinal canal:**
(*a*) Signs of cancer stomach
(*b*) Acute abdomen tabetic crises

(13) **Liver:**
(*a*) Perihepatitis
(*b*) *Cirrhosis*
(*c*) Local gumma

(14) **Rectum:**
(*a*) Gumma
(α) Submucous swelling
↓ (β) Recto vaginal fistula
(*b*) Gummatous infiltration.
(α) Proctitis

(15) **Breast:**
- (a) Local gumma → ulcer
- (b) Diffuse gummatous infiltration

(16) **Brain:**
- (a) Local gumma
- (b) Diffuse gummatous meningitis

(17) **Spinal Cord:**
- (a) Gummatous meningitis
- (b) Gummatous periostitis

Treatment. Of Syphilis

(A) *Prophylactic*

- (1) Steep in 1—2000 Hg biniodide
  ↓ Application of ℞ Calomel 33
  Lanoline 67
  Vaseline 10
- (2) Three weekly injections
  - (a) 606 0 3 gms
  - (b) 914 0 45 gms
- (3) Ingestion
  Stovarsol tablets of 0 25 gm
  Four before breakfast for five days
  In 2 or 3 successive weeks

(B) *Curative*

- (1) *Dressings of lesions*
  - (a) **Chancre**
    - (α) Applications
      - (1) Glycerine boracic lotion
      - (2) Lotio rubra
      - (3) Lotio hydrargyri nigra
      - (4) Mercury biniodide 1–1000
      - (5) Ung. diamido-azo-toluol
      - (6) Ung hydrargyri
    - (β) Baths
      - (1) Hot pot permang: 1–6000
      - (2) Hot boric acid
      - (3) Chloramine-T
    - (γ) Cleansing of sloughless wound
      ℞ Zinc sulph grs x
      Alum purif grs xx
      Glycerine ℥ vii
      Aqua ad pint i
  - (b) **Condylomata:**
    - (α) First 24 hours
      Eusol, Hg biniodide
    - (β) Afterwards
      - (1) Glycerine ichthyol: 5%
      - (2) Glycerine thymol Co
      - (3) Calamine lotion

(c) **Gummatous ulcers**
(α) Sloughy ulcer
(1) Fomentations of
( ) Chlorinated soda
( ) Eusol
(2) Vaseline to surroundings
(β) Clean ulcer
(1) Lotio rubra or nigra
(2) Unna s bandage
(3) Scarlet red

(2) *General antisyphilis therapy*

(A) *Arsenic*

Preparations (1) Salvarsan 606
Characters Yellow acid powder
Tech Dissolve in NaOH sol
Dose 0 2 → 0 6 gms
Route Intravenous
(2) Sodium salvarsan
Characters Yellow neutral powder
Tech Dissolve in water
(3) **Neo salvarsan 914**
Characters Yellow powder
Tech Dissolve in *2–5* c cs of water
Dose **0 45 → 0 9** gms
Route (*a*) **Intravenous**
(*b*) Intramuscular
(*c*) Subcutaneous
(4) **Sulfarsenol**
Characters Yellow powder
Tech Dissolve in water
Dose **0 6 gm per c c of water**
Routes (*a*) **Subcutaneous**
(*b*) Intramuscular
(*c*) Intravenous
(5) Sulfoxylate 1495
(6) Silver salvarsan
Characters Emery coloured powder
Tech Dissolve in 8 c cs of water
Dose 0 15–0 3 gm
Route Intravenous
Ind Neuro syphilis
(7) Stabilarsan
Character 606 in glucose 50%
Tech Slow injection
Routes Intramuscular or veno
Contraind for arsenobenzene preparations
(1) Hæmophilia
(2) **Albuminuria**

(3) **Enlarged liver**
(4) **Jaundice**
(5) Advanced visceral disease

Precautions : (1) *Do not starve beforehand :*
: Two hours fasting
(2) Oral : ℞ Glucose ℥ xiv
Soda bi carb grs. xv
Ol. limonis m i
Aqua ad ℥ iii
(3) Examine urine and liver & skin
(4) Examine ampoule
(5) Syringes & lotions must be cold
(6) Remove spirit or alcohol :
: By distilled water

Compl : (A) *During or immediate after* :
(1) **Nitroid crisis :**
(a) Spt ammon. aromat :
: xxx m. ; 5 min. before
(b) Subcut. adrenalin 1c.c.
(c) Alternating method :
(α) Inject 2 c c. sol.
↓ (β) Aspirate 1 c.c. blood
(2) **Medical shock :** Syncope
Path : Capillary paralysis
Clinic : Alarming collapse
Treat : Intravenous saline
(3) **Urticaria**
(4) Pain in gums & teeth
(B) *Few hours after* :
(1) Rigors with **pyrexia**
(2) Vomiting with **diarrhœa**
(3) Herpes
(C) *Within five days* :
(1) **Encephalitis :**
Treat : (a) Rest in bed
(b) Spinal puncture :
: Aspirate c.s f. 50 c.cs.
(c) Venesection :
: 60–100 c.cs.
(d) Purging
(e) Soda bi-carb.
(f) Adrenalin injection·
: v m. every 4 hours

(g) Sod thiosulphate
(h) *Oxygen inhalations*
(2) Bone marrow syndrome
Clinic (a) Purpura hæmorr
(b) Thrombocytopenia
(c) Agranulocytosis
(d) Aplastic anæmia
Treat Blood transfusion

(D) *Within one month*
(1) **Albuminuria**
(2) **Stomatitis**
(3) **Lassitude**
(4) **Dyspepsia**
(5) Chronic headache
(6) Dermatitis
Treat (a) Starch bath
(b) Talc dust
(c) Olive oil
(d) ℞ Zinc oxide ℥ i
Starch ℥ i
Petroleum ℥ ii
(e) Sod *thiosulphate*
Intraven 20 c.cs
(7) **Jaundice:**
Treat (a) Glucose
(b) Soda bi carb

Treatment Of complications
(1) **Sodium thiosulphate:**
Intravenous
0 6–0 9 gm
Every other day
(2) Hypertonic intraven. **glucose**
25 c cs of 25%
(3) Intramuscular Intramine
(4) Intravenous Redoxon (Roche)
5 c cs

(B) *Mercury*
Advant: Slow but continuous action
Methods (1) Oral
(2) Inunction
(3) Intramuscular
(4) Intravenous

Preparations · (a) Hydrargyrum cum creta : oral
(b) Ung hydrargyri · inunction
(c) Mercury perchloride intraven
(d) Mercury biniodide intramusc
(e) Calomel intramuscular

Compl (1) **Stomatitis**
(2) Nephritis
(3) Colitis
(4) Dermatitis
(5) **Malaise**

(C) *Bismuth*

Routes (a) Deep subcutaneous
(b) Intramuscular

Prepar (i) Solubles
(b) Insolubles
• Oxychloride, salicylate, etc.
(c) Oil solubles
(α) Bivatol 2 c.cs
(β) Cardyl

Dose 0 2 → 0 3 gm
Once or twice a week
Upto a total of 2–4 gms.

Compl (a) Blue line gums
(b) Stomatitis
(c) Albuminuria
(d) Dermatitis
(e) Colitis
(f) Muscular rheumatism

Treat (a) Sodium thiosulphate
(b) Intramine

(D) *Iodine* **Pot iodide :**

Action (a) Resolution of fibrous tissue
↓ (b) Access to spironema

Dose ℞ Pot iodide grs v–lx
Pot bicarb grs xx
Tr nucis vomica m iii
Aqua chloroform ad ounce i
T D S

CONGENITAL SYPHILIS

Clinic (1) **History .**
(a) Miscarriages
↓ (b) Premature dead foetus
↓ (c) Syphilitic infants
(α) Clinical manifestations
↓ (β) Late solitary lesions
↓ (γ) Only serum positive
↓ (d) Healthy children

(2) **Skin lesions :**
(a) Pemphigus :
: Bullæ → pustules
: On palms and soles
(b) Maculo papular :
: *Napkin area*
: *Nose and mouth*
: *Palms and soles*
(c) Gummata → gummatous ulcers
(d) Muco cutaneous syphilides :
. Face and outer side of thighs
(3) **Onychia**
(4) **Hair lesions**
: Loss of eyebrows, syphilitic mop
(5) **Mouth lesions :**
(a) Mucous patches
(b) Perforation palate
(c) Faucial ulceration & scars
(6) **Teeth lesions :**
(a) Hutchinson's teeth :
. Peg-shaped upper central incisors
(b) *Hypoplastic teeth*
(c) Moon's teeth .
. Dome-shaped first molars
(7) **Nasal lesions :**
(a) *Snuffles*
(b) *Saddle nose*
(c) *Perforation palate*
(8) **Laryngitis :**
Hoarse cry
(9) **Lung lesions :**
(a) White pneumonia of Virchow
(b) Localized gummata
(10) **Heart and vascular lesions**
(11) **Umbilicus** Gumma
(12) **Intestines :**
: Multiple gummatous ulcers
(13) **Liver :**
(a) *Diffuse interstitial hepatitis*
(b) Local gummata
(14) **Spleen :**
: *Splenomegaly before the age of 3*
(15) **Nephritis**
(16) **Testicles :**
(a) *Enlargement before the age of*
(b) Shrunken testis :
: Without any trauma or diseas

(17) **Bones**
(a) *Epiphysitis*
Sites (a) Lower ends of humerus & radius
(b) Upper end of tibia
(c) Costo chondral junctions
Clinic Parrot's pseudo paralysis
(b) *Dactylitis*
(c) *Periostitis*
Time Between the age of 8 and 14
Clinic (α) Localized bosses
(β) Thickened ends
(γ) Diffuse fusiform enlargement
Sabre scabbard tibia
(d) *Flat bones*
(α) Perforation palate
(β) Skull
(1) Necrosis
(2) Hot cross bun
(3) Craniotabes
(γ) Sternal swelling

(18) **Joints**:
(a) Suppurative epiphysitis
(b) Insidious chronic synovitis
Clinic *Painless bilateral effusion*
Syn Clutton's joint
Age 5 to 18 years
(c) Osteo arthritis

(19) **Nervous system:**
(a) Gumma of the brain
(b) Juvenile tabes
(c) General paralysis

(20) **Eye lesions:**
(a) *Interstitial keratitis*
(b) Iritis, irido-cyclitis
(c) Choroiditis
(d) Cataract
(e) Optic atrophy

(21) **Ear lesions**:
(a) Congenital nerve deafness
(b) Otitis media
(c) Otorrhœa
(d) Internal ear deafness

(22) Blood
Positive Wassermann or Kahn

Treat (1) **Treatment of mother:**
During pregnancy
(2) **Treatment of infant:**

2001

(A) *Mercury*:
  (*a*) *Oral*· *Calomel or grey powder*
  (*b*) Injections; mercurial cream
  (*c*) Inunctions: mercurial ointments

(B) *Bismuth*.
  3–4 mgm. per kgrm body weight

(C) *Arsenic*
  · *0 05–0 15 gm. of 914.*

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(7) **General treatment:**

(A) **Pyrotherapy:**

Ind: (*a*) Good heart
(*b*) Good tolerance to temp

Tech: Raise temp. to 106 5.
(*a*) Intravenous T. A. B.
(*b*) Malarial parasites

(B) **Sulphanilamide:** (esp M. & B. 693)
(*a*) 4·8 g daily for 2 days
↓ (*b*) 3 6 g. daily for 3 days
↓ (*c*) 2 4 g. daily for 4–8 days

(C) **Antitoxin:**
(*a*) 1 c.c. daily for 5 days
(*b*) 1 c c. every other day: 10 inj.

Compl. (1) **Balanitis:** Balano posthitis

Etio: Phimosis

Compl: (*a*) *Lymphangitis*
(*b*) Cellulitis
(*c*) Phagedæna

Treat *Dorsal slit*

Aftertreat (*a*) Irrigations and baths:
: H_2O_2; mercury biniodide, eusol
(*b*) Packs of acriflavine gauze
(*c*) Dusting powder
· Zinc oxide + boric acid

(2) **Periurethral abscess:**

Etio · Littritis

Clinic (*a*) Indurated mass
↓ (*b*) Fluctuating tumour

Compl. Urinary fistula

Treat *Aspiration* → incision

(3) **Venereal papillomata:**

Site. (1) External genitals
(2) Perineum and perianal region

Treat. (1) Trichlor acetic acid 100%
(2) Mill's wart paint:

: ℞	Liq arsenicalis	1 part
	Vin ipecac.	1 part
	Spt. vin. rect.	2 parts

(3) X Rays or *diathermy*
(4) *Dry dressings*

(4) **Cowperitis:**

Path: (*a*) Acute
(*b*) Chronic

Clinic: Prostatitis syndrome

Diag: (*a*) Digital (rectal) examination
(*b*) Urethroscopy

Treat: (a) Acute: rest
(b) Chronic: urethral massage

(5) **Spermato-cystitis:**

Clinic: (a) Erections and hæmospermia
(b) Tender mass: rectal exam.

Path. (a) Acute
(b) Chronic

Treat: (a) Acute: rest
(b) Chronic: massage

(6) **Epididymitis:**

Predisp: (1) Alcohol
(2) Exercise
(3) Sexual intercourse
(4) *Instrumentation: in acute urethritis*

Time. During or after second week

Clinic: (a) Urethral discharge. less
(b) Local acute inflammation:
(α) Painful, tender epididymis
(β) Hydrocele

Diff. diag: (a) B coli urethritis
(b) Traumatic urethritis
(c) Septic instrumentation
(d) Acute T. B testis

Treat: (a) Sharp saline purge
(b) *Intravenous calcium gluconate 10 c cs.*
(c) *Sulphonamides*
(d) Local
(α) Stoppage of instrumentation
(β) *Rest* with elevation
(γ) Applications:
(1) Glycerine—belladonna
(2) Lead and opium lotion
(3) Fomentations and hot baths

Compl: Sterility: (if bilateral affection)

(7) **Acute prostatitis** and prostatic abscess:

Clinic: (a) Perineal pain
(b) Trigonal syndrome.
: Urinary tenesmus
(c) Enlarged tender prostate.
: Rectal examination
(d) Constitutional signs

Treat: (A) Acute stage:
(a) No instrumentation
(b) *Complete rest*
(c) *Hot hip baths*
(d) Belladonna suppositories
(e) Rectal hot irrigations

(B) Chronic stage:
(a) Prostato-urethral *massage*
↓ (b) Urethral *irrigations*

(8) Ascending infection:
(a) Cystitis
↓ (b) Ureteritis
↓ (c) Pyelitis
↓ (d) Pyelonephritis

(9) Gonorrhœa rectalis
Etio Women
Path (a) Proctitis
(b) Venereal warts
(c) Ulcer
Clinic. Rectal tenesmus with discharge
Treat: Rectal irrigations:
(a) Pot permanganas: 1 in 500
(b) Silver nitrate: 1 in 500

(10) Metastatic gonorrhœa:
Syn. Gonorrhœal rheumatism
Etio. Any stage of urethritis
Path. Gonorrhœal septicæmia
Clinic: (A) *Gonococcal arthritis*: (see page 364)
(a) Arthralgia
(b) Acute arthritis
(c) Hydrarthrosis
(d) Polyarthritis deformans
(B) *Gonorrhœal fascitis*:
(a) Lumbago
(b) Talalgia
Treat. (1) Focal. Urethral irrigations
(2) Local (a) Counter-irritants
(b) Massage
(c) Movements
(3) General: Immuno-therapy
(a) Auto vaccines
(b) Stock vaccines
(c) Protein shock therapy

(11) Eye complications:
Clinic: (A) *Gonorrhœal conjunctivitis*:
Syn: Ophthalmia neonatorum
Etio: Infection during delivery
Clinic: (a) Swollen lids with chemosis
(b) Profuse purulent discharge
Compl: Corneal ulceration
(B) *Iritis*
Treat: (a) Silver nitrate 2%: prophylactic
(b) Boric or saline wash

↓ (c) Silver nitrate 1%
(d) Vaccines

(12) **Skin complications:**
(a) Vesicular and pustular eruptions
(b) Purpura
(c) Hyperkeratosis

(13) **Cardiac complications:**
: Endo, peri or myo carditis

(14) **Other complications:**
(A) *Tenosynovitis*
(B) Myositis
(C) *Fibrositis*
(D) Pleurisy
(E) Meningitis
(F) *Peritonitis*
(G) Periostitis
(H) *Myelitis*
(I) Subcutaneous abscess

(15) **Female complications:**
(1) *Bartholinitis*
(2) *Cervicitis*
(3) Metritis
(4) *Salpingo oophoritis*
(5) Rectal gonorrhœa

Cure tests: (1) Absence of urethral discharge
(2) Absence of pus in urine
(3) Anterior urethroscopy:
(a) No infiltration
(b) No stricture
(4) *Absence of gonococci in urethral smear*

Examinations:
(1) Ordinary
(2) After prostato-urethral massage
(3) After provocative dose:
Polyvalent 200 millions

CHAPTER XIV

SOFT CHANCRE

Syn: (A) Chancroid
(B) Ulcus molle

Def Highly contagious ulcer on the genitals due to infection by **Ducrey's bacillus**

Etio **Incubation 5 days**

Clinic **Multiple, painful, non-indurated** ulcers with undermined edges and leaving scars

Compl (1) **Bubo**
(2) Phagedæna
(3) Phimosis and paraphimosis

Diff diag (1) **Hard chancre**
(2) Herpes genitalis
(3) Granuloma inguinale
(4) Scabies
(5) *Penile gumma*

Treat (A) **Sores:**
- (1) Hypertonic saline bath
- (2) Alternate dressings of:
  - (a) Eusol
  - (b) Pure glycerine
  - (c) Formalin 1 in 300 In glucose 50%
  - (d) Iodoform
- (3) Cauterisation
- (4) Ultra violet rays

(B) **Bubo:**
- (1) Aspiration
- ↓ (2) Iodoform emulsion injection

CHAPTER XV

GRANULOMA PUDENDA

Def: Infective chronic vascular granuloma with dense fibrosis, of the external genitalia, conveyed by sexual contact and auto inoculation

Etio: (1) B *mucosus capsulatus granulomatis*:
Capsulated intracellular diplococcus
(2) Age. 15 to 35
(3) Sex: Females

Path: Nodules of round cells:
: Embedded in delicate *fibrous reticulum*
: Covered by epithelium
: Great vascularity
: Fibrosis

Sites: (*a*) External genitalia
(*b*) Inguinal region
(*c*) Perineal region
(*d*) Peri-anal region

Clinic. (1) Incubation: 2 to 8 days
(2) **Nodule:**
: Small, local
: Covered with delicate pink epithelium
↓ (3) Bleeding **excoriation**
↓ (4) Eccentric peripheral extension
↓ (5) Dense, contracting, uneven **scar**

Diag. Narrow, serpiginous bordered, nodular, raised, red-glazed, delicately pinkish, ulcerated or cracked **new growth**, with large area of white, irregularly, pigmented, dense **scar** and profuse, offensive, watery **discharge**

Compl: (*a*) Pseudo elephantiasis
(*b*) Stricture urethra
(*c*) Recto vaginal fistula

Diff. diag: (1) **Malignancy**
(2) Syphilis
(3) Lupus vulgaris

Treat. (1) General:
: **Intravenous tartar emetic:**
: ½—2½ gr. every other day
(2) Local:
(*a*) Applications:
(α) Ung tartar emetic in paraffin: 1%
(β) Ung boric + antimony oxide + zinc oxide + calomel

(b) Caustics
(c) Cautery
(d) Scraping
(e) Excision
(f) X Ray exposures

TROPICAL ULCER

Def Specific ulcerating granuloma of the skin caused by Leishmania tropica

Etio Sand flies

Path Infiltration of derma
By small round granulation cells

Clinic (1) Initial papule
↓ (2) Scaling and crusting
↓ (3) Slowly extending indolent ulcer
(a) Raised thickened edges
(b) Serous or milky discharge
(c) Leishmania in scrapings
↓ (4) Depressed white scar

Clinical types (a) Papular
(b) Verrucose
(c) Lupus like
(d) Generalized

Treat (1) Intravenous tartar emetic
½ gr in 10 c cs of sterile water
(2) Emetine hydrochlor 0 15-1·5 gr
Local injection
(3) Tartar emetic ointment local
(4) Phosphorus oil local

IMPORTANT POINTS

(1) Amount of antitoxin in an immunised animal is out of all proportion to the toxin injected

(2) Every injury gives an added advantage to the bacteria lodged in the wound *the integrity of the wall of leucocytes around the bacteria is a factor of great importance in checking the advance of micro organisms in the tissues*

(3) After every injury there is a phase of cellular shock with paralysis of all cellular activity The defensive mechanism of the cells and their capacity for resistance are held in abeyance

(4) Necrotic tissues once infected are a source of persistent infection they form a suitable and even essential pabulum for certain bacteria

(5) Dead spaces furnish conditions favourable for infection and when infection is once established, tend to lead to persistent infection

(6) Excessive tissue tension promotes infection and leads to its persistence and spread

(7) Foreign bodies are not only extremely important in fixing or lodging bacteria in the tissues but have a real significance in determining whether or not infection takes place and a striking influence on the persistence of infection

(8) *General defence of the body to the infection is through reticulo endothelial system* which acts by

(a) Phagocytic action

(b) Secretion of anti substances

(9) Different species of micro organisms incite a different response in the invaded body and show a marked predilection for different tissues

(10) *Œdema of the overlying skin may be the first sign of deep seated suppuration*

(11) In trifling injuries with introduction of virulent germs, localisation sometimes takes place first in the regional lymph glands

(12) *At any age of an abscess its margin should be treated with very great care and tenderness*

(13) Normally the surface of the body is in contact with countless organisms

(a) The skin

(b) Gastro intestinal tract

(c) Upper respiratory tract

(d) Urinary tract near the orifices

(e) Genital tract upto cervix

(f) Ducts opening on internal or external surfaces

(14) *Obstruction to the outflow of urine with stagnation is the most important etiologic l factor in urinary sepsis*

(15) Nitrogen in combination with hydrogen as amino nitrogen is the very corner stone of life

(16) The simple living together of bacteria is called symbiosis connoting a mutually beneficial effect

(17) *No septicæmia is maintained unless there is some focus constantly or intermittently pouring bacteria into blood*

(18) Intact skin and mucous membrane relatively seldom permit the passage of micro organisms

(19) In the great majority of cases and for the great majority of organisms there must be a slight break in the primary defensive wall or a physical change in its surface before they can pass this barrier

(20) Most diffusible substances will lower surface tension on the side on which they are acting bacterial products

diffuse and lower the surface tension of the place to which leucocytes are attracted

(21) *A cold abscess should never be aspirated directly over the swelling, but always at some distance away, through healthy tissues, and the track of the needle should be valvular*

(22) *Leucocytosis is a measure of the reaction of the patient to the infection If the relative number of polymorphs is increased to 85%, pyogenic infection is always present, regardless of the total count*

(23) *Treatment of potential sepsis is excision or debridement*

(24) *Treatment of established infection*

(a) *Aiding the local defence reaction*
+ (b) *Supply of antibodies in circulation*
↓ (c) *Incision*
+ (d) *Extrusion of foreign bodies and necrotic tissues*
↓ (e) *Drainage*

(25) When an acute, infective inflammation about a wound has lasted 3 or 4 days, pus has generally formed in the tissues, when acute local symptoms have been present for four or five days in a deeper focus, pus is generally present

(26) *Do not use local anæsthesia in inflamed tissues*

(27) In purulent collections in deeper tissues in circumscribed purulent collections with necrotic tissues in the peritoneum, in purulent collections in the joints and pleuræ, introduce *a drain upto the focus, to establish a track to the surface*

(28) General defence reaction as shown by toxæmic pyrexia is an accurate index of the drainage.

(29) *Too prolonged drainage tube is a dangerous thing*

(30) In any infection excision or wide removal of any focus after the stage of general dissemination in a body in which considerable immunity is established, is satisfactory Excision of initial lesions and excision done during the early stages of dissemination are not satisfactory

(31) *Hypodermic syringe charged with adrenalin solution should be invariably in readiness whenever an antiserum is being administered*

(32) *Give a second dose of serum within a week of the first*

(33) Common characters of anærobic bacteria

Habitat (a) Fæces of herbivora
↓ (b) Richly manured soil

Morph (a) Rod shape with round ends
(b) Irregular forms
(c) Spores.

(α) Oval or round
(β) Terminal or subterminal
(d) Motile
Except B Welchii
(e) Gram positive

(34) *Spores of all anaerobes are very resistant to heat, to drying, and to disinfectants*

(35) Weighing machine and pyrexia are most important indications as to the correctness of dose or interval in tuberculin injections

(36) With the exception of erysipelas stock vaccines are useless in streptococcic infections autogenous vaccines must be used

(37) Stock vaccines of pyogenic staphylo streptococci have a distinct sphere of usefulness in prophylactic treatment of burns, scalds, and compound fractures

(38) Prophylactic injections of autogenous B coli vaccines are of value in colonic surgery

(39) *Medical officers are warned against a hasty declaration of venereal disease to the patient before the clinical evidence has been confirmed by positive pathological results*

(40) *In the examination of suspected venereal disease, always wear rubber gloves to avoid accidental infection*

(41) In primary syphilis, 75% of cases give a positive serum result during the second week after the appearance of the chancre In secondary syphilis 100% are positive In tertiary stage, 80–97% and in tabes 70–90% are positive

(42) *Drugs in general use against syphilis are*
(a) *Arsenic*
(b) *Mercury*
(c) *Bismuth*
(α) Lower toxicity
(β) Easier administration

(43) Proper care of the primary wound is by far the most important single step in the prophylaxis of tetanus The prophylactic dosage of the antitoxin as a routine measure is another

(44) Any unusual septic papule or sore in a patient working among skins or hides ? Anthrax

(45) *Chronic swellings about the groin, cord, testis and scrotum in patients from the tropics should always be regarded as possibly filarial*

(46) *Anaesthesia is rarely absent in leprosy*

(77) Do not immobilise a gonococcal joint in Plaster of Paris the right treatment is:

(a) Massage
+ (b) Movements
+ (c) Radiant heat
+ (d) Diathermy
+ (e) Pyrotherapy.

(78) *In every case of a doubtful swelling in any part of the body, do not forget syphilis, take Kahn*

(79) A cancer can mimic a gumma very closely.

(80) Absent knee jerk

(a) Syphilis
(b) Old age
(c) Congenital
(d) Peripheral neuritis
(e) Diphtheria

(81) *Prevention of iodism.*

(a) *Raise the dose of pot. iodide*
(b) *Intravenous sod iodide 60–90 grs*
(c) *Oral mixture immediately before meals in plenty of water*

(82) *Precautions in Diphtheria.*

(a) *Strict isolation of*
(α) *Patient*
(β) *Attendants*
(b) *No attendant who has pharyngitis*
(c) *Face masks for all contacts*
(d) *Prophylactic antiserum for all contacts*
(e) *Destruction of infected material*

(83) *Never examine a suspected diphtheria case without wearing a face mask.*

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